

3D WORLD

THE MAGAZINE FOR 3D ARTISTS



INSPIRATION / EXPERT TUTORIALS / CD INSIDE

CROWD CONTROL

Simulate a school of fish in motion
using 3ds Max's Crowd system



OPINION

Lucas speaks
out on life
after Star Wars



ON TEST: MAYA 7 & XSI 5
FACIAL MODELLING TRICKS
CG LIGHTING: THE BASICS
THE MAKING OF 24: THE GAME
STUDIO PERKS: THE TRUTH!

NEW TECHNOLOGIES

human 2.0

How virtual characters will
look and act by 2010



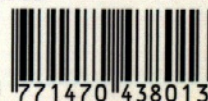
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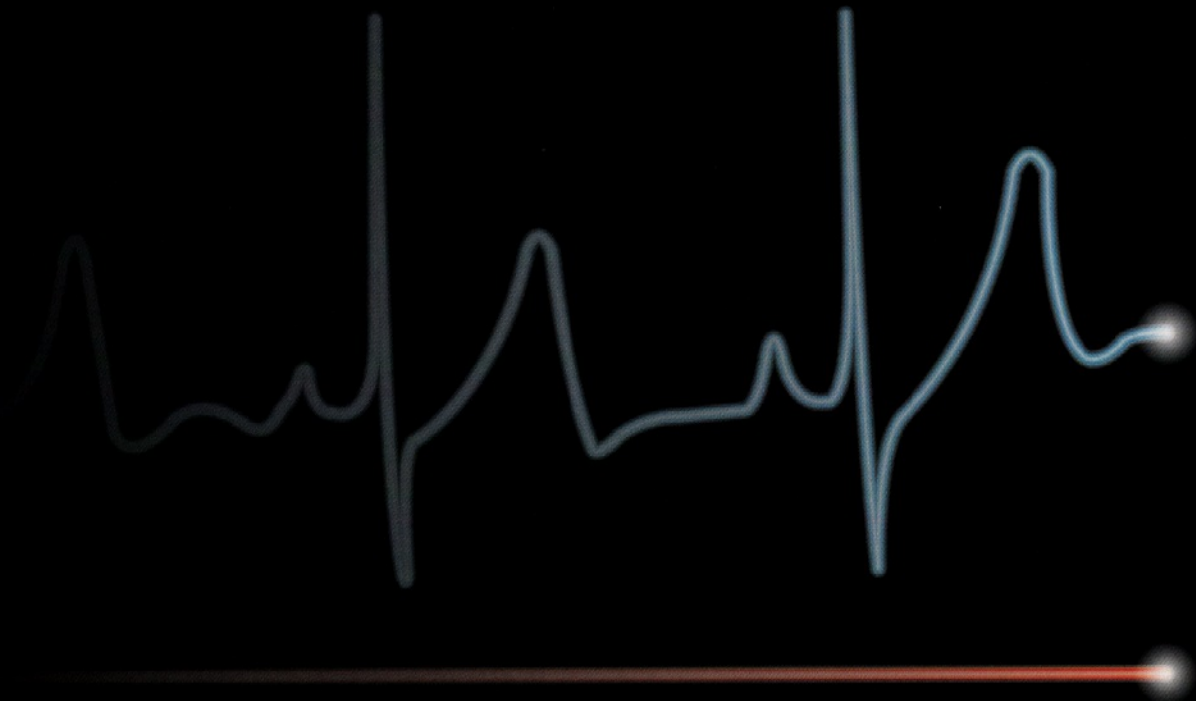
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COVER ARTIST

Olivier Ponsonnet

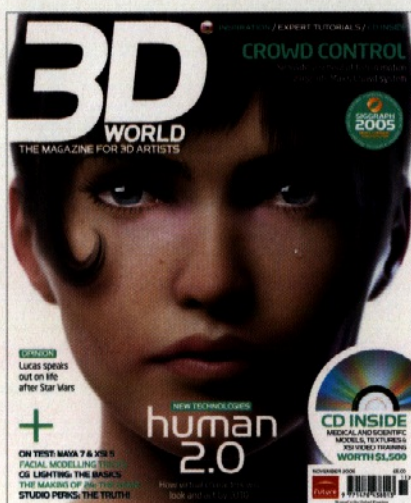
OLIVIER PONSONNET is a French student living in Bordeaux who's currently working on a programming course while indulging in his passion for 3D. The somewhat unstructured techniques he applies to his work often lead to surprising results. "It's not uncommon that I obtain something good but completely different from the idea I had at the beginning," he says.

Deriving much of his inspiration from European comics, including *Xico*, *Rapaces* and *Sha*, plus manga titles such as *Appleseed*, *Gunnm* and *Blame!* He uses *3ds Max* for modelling, shading, lighting and rendering, and *Photoshop* for postproduction and maps. Olivier recently bought a Wacom Intuos3 tablet, which will undoubtedly help with workflow and productivity, and especially for the precision he requires for the kind of work he undertakes.

"I search for aestheticism and beauty through the female portraits I do," he explains. "The two things are interdependent: to make a beautiful character, you need to give it soul."

You can discover more of Olivier's techniques and tips in our *Trade Secrets* feature this issue, starting on page 54.

<http://rev1v.free.fr>



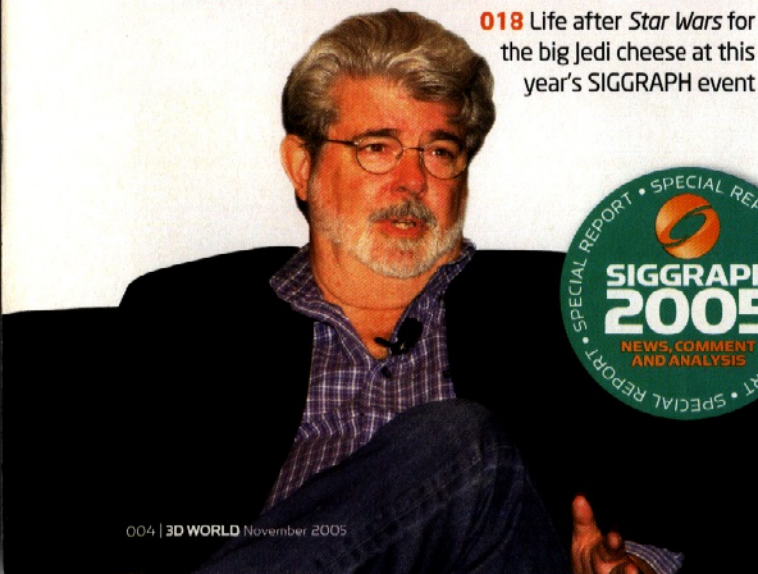
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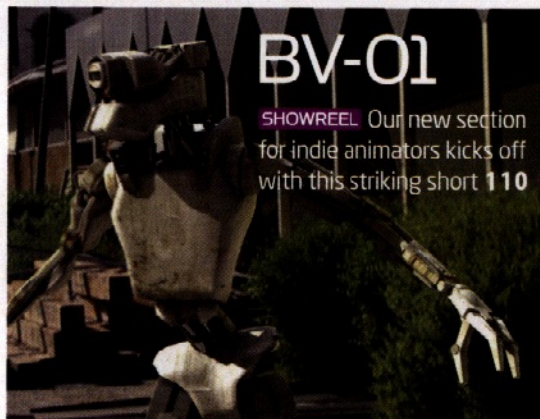
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Light trails

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**European Representative,
DreamWorks Animation**

Shelley Page started her career in feature animation as Backgrounds Supervisor on Disney's *Who Framed Roger Rabbit?* She was one of the first artists hired to form DreamWorks Animation in 1995. She's now DreamWorks' European Representative, resourcing new talent for the studio.
www.dreamworks.com

JORDI BARES



Senior 3D Animator, The Mill

Jordi Bares worked for eight years in the games and film industries in his native Spain before moving to London in 2000, where he has freelanced at Jim Henson's Creature Shop and Passion Pictures. The winner of many awards, he was nominated for an Emmy for his work on the BBC documentary *Pyramid*.
www.the-mill.com

ANDREW DAFFY



CGI Supervisor, House of Curves

Andrew Daffy has worked in the CGI industry for ten years on projects that have accumulated over 30 awards. He was recently named one of Alias's *Maya Masters* for 2004. His new company, The House of Curves, will act as both a studio and a training school.
www.thehouseofcurves.com

ALEX MORRIS



Director, Hayes Davidson

Alex Morris qualified as an architect in 1990 and joined the architectural visualisation agency Hayes Davidson in 1996, having completed over 40 buildings across a number of sectors. He is responsible for many of HD's landmark images, including the UK's Millennium Dome and the Tate Modern art gallery.
www.hayesdavidson.com

JOLYON WEBB



**Principal Artist, Codemasters
Software Company**

Jolyon Webb moved into developing game art after years as a freelance illustrator. He works at leading videogame studio Codemasters as Principal Artist in the Central Technology Group, which is the company's internal research and development team.
www.codemasters.co.uk

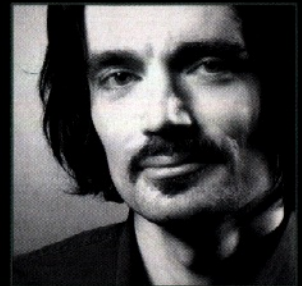
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Department and a Creative Director for the commercials department. Scott, Bobby and Stefan have over 20 years' combined experience at Aardman, working on a range of award-winning ads, idents and short films.
www.aardman.com

Editor's perspective



Mixing science and futurology is like mixing contortionism and whiskey: do it long enough, and you'll eventually end up having to remove your foot from your mouth. Digital Equipment Corporation CEO, Ken Olsen, discovered this in the 1980s, having predicted in 1977 that there's "no reason for any individual to have a computer in his home."

The risk of dental gymnastics is particularly acute when, like Olsen, you predict that something won't – or can't – happen. So we couldn't help fearing for the state of George Lucas's bridgework when he commented in his SIGGRAPH 2005 keynote speech: "The real leap has been made. [Digital technology] is cumbersome, it doesn't always work as well as we'd like, but what's left to develop is mainly better knobs and whistles. We don't need to reinvent the wheel: we've already reinvented it."

On the show floor, at least, few people were arguing with him. While the world and its dog unveiled new products at SIGGRAPH this year, most of these, such as *Maya 7*, *XSI 5*, *3ds Max 8*, *LightWave 9*, *Houdini 8* and *Fusion 5* (I could go on, and with 300 words still to write, the temptation is strong, but you get my point) fall into Lucas's category of better knobs on existing products.

Of course, there were a couple of entirely new applications. In particular, T-Splines, a start-up marketing its *Maya* plug-in of the same name, was at pains to point out that it's "not merely another piece of run-of-the-mill modelling software, throwing new bells and whistles on old technology."

A 'superset' of NURBS and Sub-D surfaces, *T-Splines* enables artists "to work in ways that were mathematically impossible before," requiring up to 75 per cent less control points to generate a surface. Whether this will really start a new wave of 3D modelling remains to be seen, but it's certainly interesting. You can find an exclusive learning edition of the software on the CD this issue.

But it's outside the show floor, in SIGGRAPH's papers and technical sessions, that new technology most commonly emerges. This year, two topics in particular occupied the speakers' time: real-time rendering for games, and new techniques for creating digital characters. We'll be returning to gaming in future issues, but we thought it would be interesting to ask the researchers present at the show to predict what virtual actors will look like by 2010. You can find out what they said on page 38.

The rest of our show coverage, including George Lucas's keynote speech, starts on page 16. Looking back over it, I can't help wondering which of our own predictions we may come to regret in hindsight. But here I have a foolproof plan. In addition to being a technological event, SIGGRAPH is also an immensely social one. Like the contortionist, if any of our opinions prove to be hideously misguided, I'll simply blame it on the whiskey.

JIM THACKER Editor
jim.thacker@futurenet.co.uk

LETTER OF THE MONTH

Having recently made a couple of trips to the cinema to see the latest *Star Wars* film [3D World, issue 66] and the big-screen adaptation of *Hitchhiker's* [3D World, issue 65], I thought I'd make a few comments about the effects.

Some 20 years ago, the BBC used a person with a spare sleeve to portray Zaphod Beeblebrox's third arm. In the new film, it's clearly superimposed and is quite jerky. Why not stick to the old method, only with the extra providing the spare arm in green, so that he could be masked out of shot later?

With *Star Wars*, while the battles were lovely, some of the character CGI was decidedly ropery. The lighting was off on the faces of quite a few of the Clone Troopers. Again, it would have been better to have kept the helmets on instead of having the actor's head on several different figures. I won't even comment on the lizard with Obi Wan on its back, as that could take up a whole letter in itself.

Basically, what I'm saying is that sometimes, less is more. And to George Lucas: if in doubt, leave the CGI out.

Noel Wallace, via email

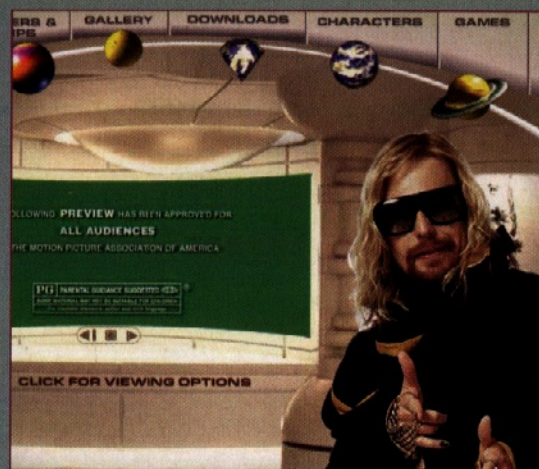
Digital technology certainly allows directors to plan shots that would once only have been achievable with physical effects - or, more likely, dropped from the movie entirely. But it's another thing to argue that studios now end up using CG in preference to alternative techniques simply because they can.

While Industrial Light & Magic declined to comment on *Star Wars*, Adam McInnes, Visual Effects Supervisor at Cinesite Europe, offered the following thoughts on *The Hitchhiker's Guide to the Galaxy* - and on Zaphod Beeblebrox's extra limbs in particular: "I'm sorry that you were disappointed with this aspect of the visual effects. I hope it didn't detract from your overall enjoyment of the film. But in fact, I believe there are only three composited third arm shots in the entire finished film. We sparingly used a prosthetic arm on a couple of other occasions. This small number reflects the production's desire to minimise an aspect of Zaphod's character which the director felt was not particularly central to the storyline, and that would hinder the spontaneous flow of performance during filming. The scenes were generally shot in fairly long continuous runs that would have made the integration of an 'extra hand performer' difficult."

LETTER OF THE MONTH



Congratulations to Noel Wallace, who wins a copy of *Exposé 3*, published by Ballistic Publishing. The third in a series of annual surveys of the world's best new digital artwork, this coffee-table book contains 208 pages of imagery, featuring the work of 181 of the industry's leading artists. The content spans the worlds of 3D, game design, digital illustration and architectural visualisation.
www.ballisticpublishing.com



Sam Rockwell's Zaphod Beeblebrox may be a world away from the old days of puppets and prostheses, but is the new *Hitchhiker's* movie a case of one virtual effect too far, asks 3D World reader Noel Wallace?

MENTAL ROY: ALL TRIPPED OUT

> With Mental Roy's mildly sarcastic humour and his circuitous writing, I'm not quite sure what the point of his

column in issue 67 is. Is he complaining about the lack of original CG productions for children or for adults? If his argument is with children's films, I would say there's little reason to try anything truly

original. Six-year-olds are not taken to a film with any expectation of being intellectually challenged. They just want to be amused for two hours.

If Roy's complaint is about CG films for adults, lack of overwhelming demand for such films is the root cause. If film studios thought there was a market, they certainly would be trying to fill it. He also asks the reader for the name of a CG animation franchise for adults. I would answer *Tripping the Rift*, the new season of which is currently airing on the Sci-Fi Channel. I vaguely recall that when the first season of *Tripping the Rift* was airing, 3D World did a promo for an upcoming article on the show, but it never materialised. I was really looking forward to that story, hoping it would provide some details on how they animated the ... er, Soft Body Dynamics of the science officer, Six.

Jim Kangas, via email

because adults don't constantly pester their parents for film-related action figures, lunchboxes, DVD spin-offs, T-shirts, tattoos and breast implants. Although fans of *Tripping the Rift* might come to think of it." As for the article, itself we hang our heads in shame. We got into a tangle over when the series would be screened outside the States, and ended up never running the feature. Six's secrets remain sadly - and atypically - unplumbed.

SIGGRAPH SLIP-UP

> After receiving issue 69 of 3D World, I was looking forward to viewing your round-up of SIGGRAPH 2005, but I was rather disappointed by your lack of coverage of the new version of *LightWave*. All of the other major packages got some magazine space, but there was nothing at all on NewTek's recent developments.

Version 9 will include some major changes to *LightWave*'s core features,



Want evidence of animated TV for adult audiences? Look no further than *Tripping the Rift*. Want details of Six's 'Soft Body Dynamics'? Look no further than ... another magazine



● No, you haven't missed it. Although issue 69 went to press before the start of SIGGRAPH 2005, show coverage can be found in the Pre-viz section this issue

including adaptive Sub-D surfaces, which I know will be a major boost for many users.

Do you not regard *LightWave* as a serious 3D tool now, or think that it's unable to compete against heavyweights such as *Maya* and *3ds Max*?

Steve Cullum, Cullum Graphics

As we said at the start of the magazine, issue 69 of *3D World* went to press a couple of days before the start of SIGGRAPH, so our coverage of *Maya 7*, *XSI 5* and *3ds Max 8* was written on the basis of pre-show demos. Details of *LightWave 9* arrived too late to be included in issue 69, but can be found in our Pre-viz section this month, along with the rest of our show coverage.

As to whether we regard it as a serious application: projects created in *LightWave* feature regularly in the magazine (for example, the Volkswagen 'Summer's Morning' ad included in Close Up last issue). We have also just begun a new four-part series of tutorials on CG lighting using the software, which you can find on page 56.



● Stills from *Haruwo*, a 30-minute short created by Japanese animator Shao Guee. Thanks to Simon Edmondson for drawing this neglected gem to our attention

A CAT LOVER WRITES

> I'm a recent fan of *3D World*, and have read the last five issues.

However, I'm surprised not to have seen any coverage of *CAT* [Character Animation Toolkit].

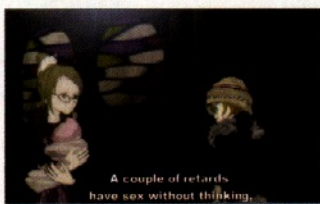
I've been using this incredible *3ds Max* tool for almost two years now and I find it an indispensable application in my toolset. I've checked the *3D World* Buyer's Guide, but could still find no mention of it. Have I simply missed the reviews?

Lee Ravn, via email

Lack of space prevents us from listing plug-ins in the Buyer's Guide, but we reviewed *CAT* back in issue 50. Version 2 was previewed at SIGGRAPH, and we'll be covering it when it ships.

ANIME MAGIC

> Following your coverage of new anime and Japanese animation projects in issue 69, I thought I would write in to draw your attention to *Haruwo*, a 30-minute cel-shaded short created in *Animation:Master*. It is



A couple of retards have sex without thinking.

apparently all the work of one person and the result of a year's solid work. The story may not be to my taste, but the design work and detail alone are worth watching, never mind the animation. I would go so far as to say it's the most impressive-looking piece of work I've seen for a long time on the web.

In case you're wondering, I live in East Anglia, not the Far East, and have nothing to do with the production. I just use the same software – sadly, not to the same effect!

Simon Edmondson, UK

According to translator Mike Stamm, animator Shao Guee did indeed create *Haruwo* entirely single-handedly, even performing the music and supplying the voices for some of the minor characters. Japanese speakers can find more information at his site, www.shaoguee.com.

The film has received little coverage in the Western press, but an English-language DVD is apparently in the works. In the meantime, Mike's subtitled version is available at <http://amfilms.hash.com/search/entry.php?entry=1056>.

SEE YOU NEXT TIME

> Guess what kind of day I am having when I name save files as 'C**ting_Sky.ma'.

Craig Crane, via the forum

One in which all of the sunset scenes will shortly be dropped from the film?

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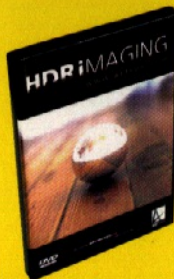
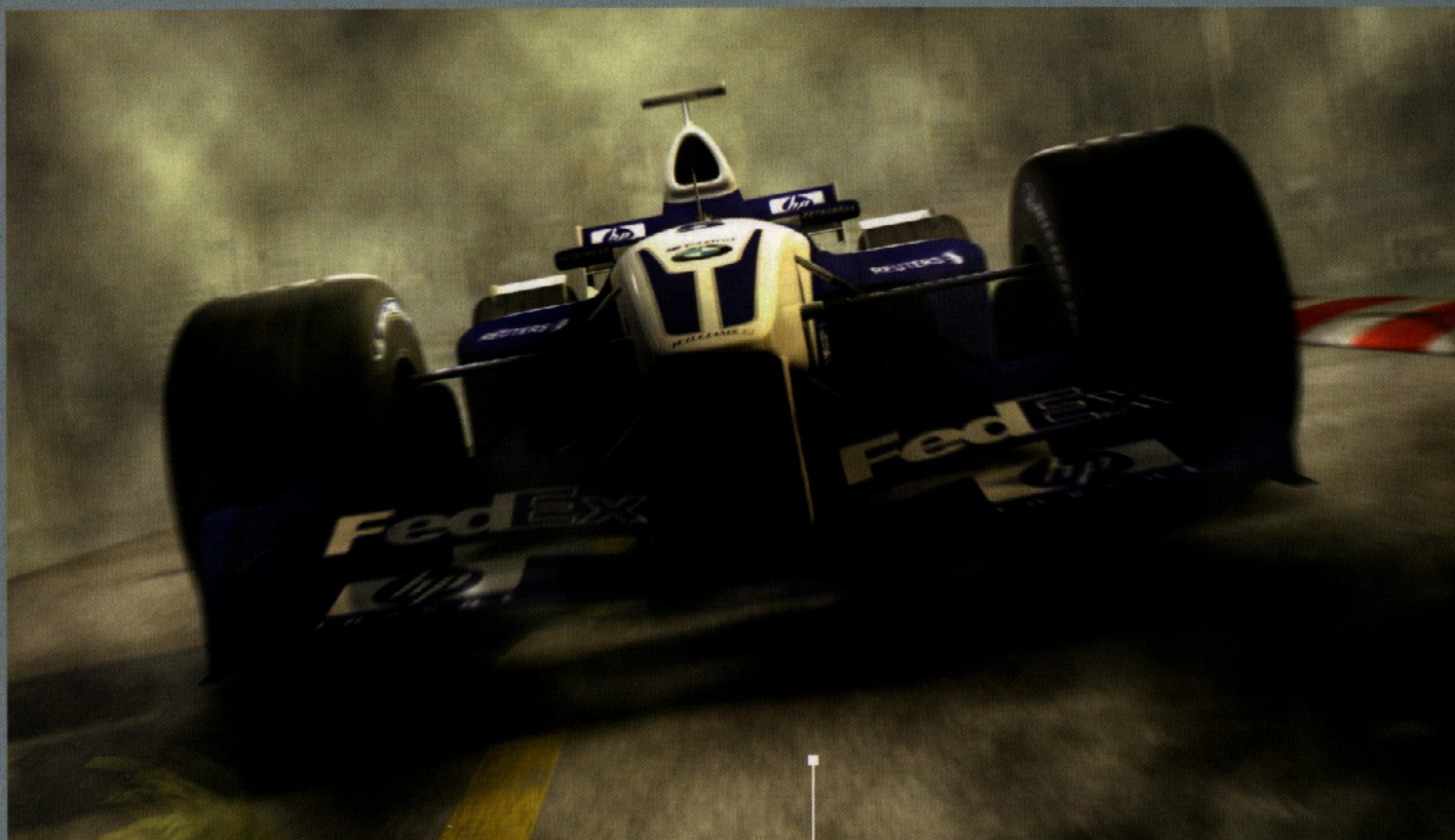


IMAGE OF THE MONTH

Congratulations this month to **Eric Bartlett**, who wins a copy of the *Extreme Hires HDRI Library*, worth \$119. This prize is supplied by ART VPS, creators of the powerful PURE hardware 3D rendering cards. www.artvps.com



ERIC C. BARTLETT Panda Mecha
3ds Max 7

"I graduated from the Art Institute of Colorado in 2002 with a BA in Media Arts and Animation, focusing on 3D character modelling and design. Born in Lakewood, Colorado in 1979, my influences range from Saturday morning cartoons to sci-fi, fantasy and adventure films. The panda was modelled freeform in *3ds max 7* using nature photography and anatomical references, to capture the look and feel of a real giant panda in a stylised robot. Starting with low-poly primitives, I used EditPoly, Shell and TurboSmooth to create most of the parts. The materials were a combination of *DarkTree* and *Max* procedural maps. I'm currently reworking my modelling portfolio as I work towards getting my first job in the industry."

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ANTHONY NIXON Williams
Maya, Photoshop

"I live in Sydney and have just graduated from a digital media course in which I focused mainly on creating 3D animation professionally. I was introduced to *Maya* in 2001 and haven't been able to put it down since. I've spent the past few months developing an animated short story, but I also enjoy complex modelling, so I thought I'd have a crack at the Williams F1 BMW FW24."

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SAMUEL AXELSSON Linnéa
Maya, mental ray, Photoshop

"I'm a Swedish 2D/3D artist, and I work at Ashton Visual Effects - a subsidiary of The Chimney Pot. This image was a modelling and texturing project. The skin was made with *mental ray*; the hair in *Maya* Paint Effects, rendered separately and composited in *Photoshop*."

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EXHIBITION

Send us your exhibition images | For postal address, see page 9

BOIS JÉRÔME La trahison d'une époque
Bryce 5, Amapi 6, Photoshop

"I studied typography, and am currently working in a real estate office. I began to produce 3D artwork in January 2004, and essentially work with *Bryce 5*. My models are made using *Amapi 6* and, for post work, I use *Photoshop*. I'm inspired by a lot of artists, such as Rudolf Herczog, the fantastic world of Andy Simon, or the works of Orbital (Joe Viton). For this image, my challenge was to play with colours, the forms and the science fiction side of the natural landscape. At the moment, this kind of activity is just a hobby and a pleasure, but I'm thinking about producing these projects on a freelance basis, in the architectural field or in virtual communication."

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STEVE UPHAM *Alphascape*
Poser 4, Vue d'Esprit, Photoshop

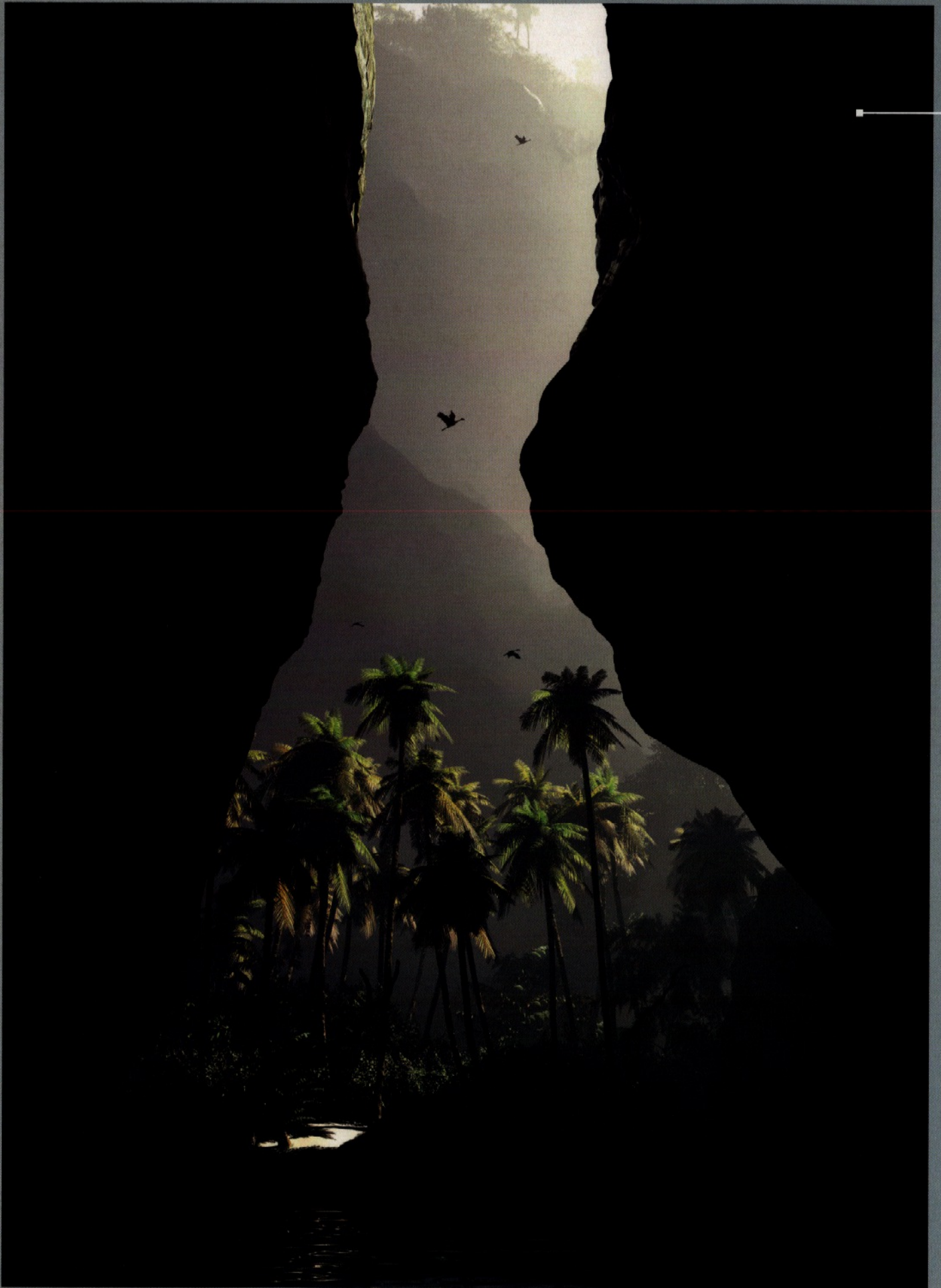
"These images were part of a series produced as one-off prints for the art show at this year's Worldcon sci-fi convention in Glasgow (4-8 August 2005). It was my first attempt at entering a convention and I was very pleased and surprised that most of the work did actually sell at the show! I'd like to create a lot more fantasy and sci-fi inspired artwork, and to enter more shows and conventions. My digital art is still really just a hobby for me at the moment, though I pick up the odd freelance job now and again. I hope to have more opportunities to work in this area in future. I use various 3D software to create my images but always finish each piece in *Photoshop*. I enjoy experimenting with colour variations. In particular, in order to achieve the best final output for each image."

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EXHIBITION

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THOMAS JUUL KRAHN Mantra
Vue d'Esprit, Photoshop

"I'm 17 years old and come from Denmark. CG art has been a hobby of mine ever since I tried a demo of *Bryce 2* many years ago. I then moved on to *Vue d'Esprit* and am now primarily working with a combination of *Vue* and *Photoshop*. I like making landscapes - the more incredible the better! Until now, I've only used *Vue*, but I've recently discovered digital matte painting which seems to be the perfect medium for me. It combines 3D, photo manipulation and drawing, and I can use it to create the images I've always wanted to."

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MARTIN HENTZE Camaro '69, Time machine, Crying girl
Cinema 4D, Photoshop

"All my 3D artwork has been produced in my own free time so far. In October, I'll start studying at the College of Art and Design in my home town of Halle, Germany. I deal mainly with models of old American cars - their form interests me the most. To produce this car model, I used *Cinema 4D* and *Photoshop*. It took one week. At the moment, I'm working on a model of a DeLorean, converting it into a graphic representation of the time machine from the movie *Back To The Future*."

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PRE-VIZ

NEWS / OPINION / ANALYSIS



All quiet on the western front?

SHOW REPORT SIGGRAPH 2005 did feature innovations, but many of them outside the show floor. However, more new products look likely to be in evidence when the show moves back east in 2006

With no surprise announcements, company acquisitions or major new product launches at SIGGRAPH 2005, the show's focus very much fell on the major professional 3D software developers and the new versions of their various flagship titles. *3ds Max 8*, *Maya 7*, *MotionBuilder 7*, *XSI 5*, *Houdini 8*, *Cinema 4D 9.5* and *LightWave 9* all fought for attention on the show floor. And with news from *modo* developer Luxology that its R&D team is currently brewing up a 3D animation package, with a first glimpse no doubt at SIGGRAPH 2006, competition looks likely to be even stiffer next year.

One sign of a competitive market is price reduction, and this year, it was NewTek's turn to announce a hefty cut: *LightWave 3D* was reduced by \$800, from \$1,595 to a rather more attractive \$795.

Other developers made efforts to increase the desirability of their products by highlighting the work their customer consultation departments had done hand in hand with R&D teams at visual effects facilities. All seemed keen to emphasise that their software was more than just an 'off-the-shelf' package.

One such example came from Softimage, which used a technology preview of forthcoming product *Face Robot* to stir up excitement among its 3D user community. The facial animation and digital acting software has been developed by the company's Special Projects team in conjunction with Blur Studio. Jeff Wilson, Animation Supervisor at Blur, explained how *Face Robot* has been built on a new computer model of soft tissue that mimics the full range of emotions portrayed by the

human face. He emphasised that, as a result, the number of mocap markers used during a shoot could typically be reduced from over 100 to around 30, therefore speeding up the entire capture-to-animation process. Details were scant, but with *Face Robot* scheduled to ship this autumn, the inner workings of the software should soon become clear.

Maxon had also been collaborating with a high-profile studio – in this case, Sony Pictures Imageworks. The two companies have been working together to develop an advanced toolset for digital matte painting called *Projection Man*. This is scheduled to ship in early 2006 as part of Maxon's new *Production Bundle* for visual effects facilities, which will include the developer's entire product offering, as well as 16/32-bit 3D painting tools, matte painting tools, *RenderMan* output and a Linux version.

Many of the major software packages – *XSI*, *Cinema 4D*, *Houdini* (Windows and Linux) and *LightWave* – were also shown off in 64-bit-compatible editions, although Alias and Autodesk went less far, only previewing 64-bit alpha versions of *Maya* and *3ds Max*.

Also on the hardware front,

Nvidia and ATI attracted a constant queue of visitors to their booths by showcasing real-time visualisation technologies. In particular, ATI claims that it has seen its market share rise from 12 per cent in 2003 to 47 per cent by 2004. However, on the evidence of the crowds thronging its stand, it wasn't the company's main offering, but a new piece of software demonstrated in a single pod that provided the main draw. With no marketing other than an A5 product card, it was a kids' 3D graphics package with a \$35 price tag called *Cosmic Blobs* that caused a storm at SIGGRAPH.

According to its developer, the groundbreaking surfacing mathematics at the core of the product allow the direct manipulation

PLUGGED IN

CG AWARDS

ACM SIGGRAPH presented awards to Tomoyuki Nishita from the University of Tokyo for his work on rendering of natural phenomena. Jos Stam, senior research scientist at Alias was recognised for his pioneering work on subdivision surfaces and on fast algorithms for the simulation of natural phenomena. Ron Fedkiw of Stanford University (and a consultant to ILM) received the Significant New Researcher Award for contributions to the field of computational fluid dynamics.





● Shout if you saw anything new this year: while some of the major 3D developers released new products, such as Softimage's *Face Robot*, many of SIGGRAPH 2005's innovations were on display outside the show floor

FEED BACK

This issue, we'd like your opinion on George Lucas's comments during his SIGGRAPH 2005 keynote speech that the major discoveries in computer graphics technology have already been made. (For more details, see pages 7 and 18.)

The question we'd like you to answer is: 'Is George Lucas right to say that the real leap has taken place, and all that remains for developers to do to 3D software is to add better knobs and whistles?'

● **Absolutely** - CG technology is already a mature field. All that remains now is to refine the software to handle existing tasks more quickly and efficiently

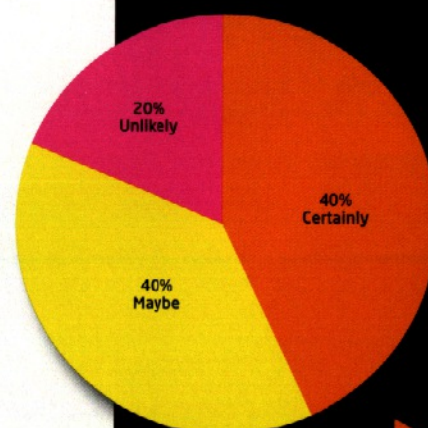
● **Possibly** - it's conceivable that new core technologies could emerge, but as the years go by, the chances of a major new discovery are beginning to recede

● **Unlikely** - It would be rash to claim that everything that can be discovered has already been discovered. History has shown that such claims often turn out to be false

● **No** - what on earth are you talking about? With new hardware permitting film-quality rendering in near real time, the rules of the industry could be rewritten entirely

LAST ISSUE: THE VERDICT

'Is the UK government to blame for the closure of companies such as Jim Henson's Creature Shop?'



TALKING POINT | Personal highlights from SIGGRAPH 2005



"Historically, AI has been accessible only by programmers. Utilising software such as NaturalMotion's *endorphin* when creating simulations allows artists to build believable adaptive behaviours to alleviate otherwise dangerous or impossible mocap situations. Softimage's *Face Robot* also looks a great place to start with facial simulation and capturing."

Ron Martin, Electronic Arts, Vancouver



"Perhaps the theme this year was that if you want to create photorealistic images, you have to go out and measure what happens in the real world, rather than using convenient models from computer science. This includes shading and texturing (based on measuring real materials), animation (using mocap data) and lighting (using HDRI images to capture the lighting you want to match)."

Dr Kevin Campbell, Cinesite



"My highlights were the launch of *3ds Max 8*, new versions of *Max* rendering plug-ins *finalRender*, *V-Ray* and *Brazil* r/s and Autodesk's *Taxi* demonstrating real-time adjustments to HDR imagery from multiple users on a network. AMD's demo of a four dual-core Opteron system rendering an eight-thread raytraced scene in *LightWave* was also impressively fast."

Alex Morris, Hayes Davidson

of surfaces while maintaining curvature continuity throughout - and that's without using NURBS or subdivision surfaces.

In addition to its new product announcement, Luxology unveiled *modo 201*, which now boasts UV mapping, a rendering engine (able to render complex scenes at very high resolutions) and 3D paint, together with new modelling advancements. Company President Brad Peebler revealed that *modo* for Linux was in development and that an animation module was coming soon. He also showed some of the fruits of Luxology's relationship with texture-synthesis software developer Allegorithmic. At the end of the user group meeting, Peebler raised anticipation by concluding: "And that's just a small slither of what's under the hood of what's to come from Luxology."

Elsewhere, crowd simulation developer Massive Software announced GPU-accelerated rendering as well as *Massive Jet*, an 'out of the box' large-scale digital crowds creation package priced at under \$6,000 and anticipated to be available before the end of the year.

Autodesk's showed new tools in the latest release of *form.Z 5.5* as well as a sneak preview of *form.Z 6*, which features object animation, and is scheduled for a release before the end of the year.

However, one of the most talked-about exhibits at SIGGRAPH (other than the \$100,000 custom Chopper that Boxx Technologies was giving away) was found outside the show floor, in the Emerging Technologies hall. The Galvanic Vestibular Stimulator enabled a remote control device to be used to control another person's sense of balance via low-voltage electric currents to their inner ear. Its applications varied from games to pedestrian anti-collision.

Over 29,000 delegates attended SIGGRAPH this year - 1,000 more than 2005. Those who found the papers and courses a tad too trying took refuge in the art gallery or retired to one of the many immersive domes where they could lie back on bean bags and chill in the midst of a 360-degree spatial spectacle.

www.siggraph.org/s2005

Have your say | <http://forum.3dworldmag.com>

Life after Star Wars

OPINION Episode III may be complete, but the story is far from over. During his SIGGRAPH keynote speech, George Lucas revealed details of some of his upcoming projects



What does the world's most famous filmmaker do on the completion of his life's great work? Simple: he turns to education. Over the course of a one-hour keynote presentation at SIGGRAPH 2005, which also touched on his origins as an artist, his work with Industrial Light & Magic, and the development of the two *Star Wars* trilogies, George Lucas set out his plans to convert the movie industry to the digital filmmaking techniques that he helped to pioneer.

"I thought that when people saw the results [of *Star Wars: Episode II*, which was shot entirely digitally] and that the quality was as good as film, the revolution would begin," he said. "But that was years ago, and we're still waiting."

To this end, the director has just founded a new state-of-the-art studio complex, the Letterman Digital Arts Center, located near the foot of the Golden Gate Bridge in San Francisco. In addition to developing a next-generation production pipeline that will unify content created by Industrial Light & Magic and LucasArts [Pre-viz, issue 68], the Letterman Center will act as a training facility for the next generation of digital arts professionals.

Lucas describes its function as threefold. The first is pragmatic: to refine the skills of new recruits to Industrial Light & Magic and LucasArts to the point at which they can be deployed on commercial projects. The second is promotional: to raise awareness of the opportunities offered by digital production techniques among the movers and shakers of the Hollywood film industry, a world Lucas characterised as "notoriously backward."

The third group of people to be educated at the new facility will be those who weren't even born when the first *Star Wars* movie was released. Lucas plans to work with Bay

● Fans of the digital effects pioneered in the *Star Wars* films still have a lot to look forward to



"PEOPLE ARE GOING TO LOOK BACK AT FILM AND GO, 'THIS IS SO NINETEENTH CENTURY'"

GEORGE LUCAS, LUCASFILM CHAIRMAN AND DIGITAL PIONEER

Area schools to increase the basic visual literacy of a new generation of graphics professionals.

"The educational system is woefully lacking, even in terms of understanding what computer graphics are," he said. "Digital technology is the virus that is going to change it. I'm just hoping that it will change it for the better."

In addition, Lucas continues to develop his own creative projects. Asked by session chair Bruce Carse how he was facing up to the "big blank canvas" left by the completion of the second *Star Wars* trilogy, he commented: "It's not looking like a blank canvas to me. I've got hundreds of projects I want to do, and I'm running out of time."

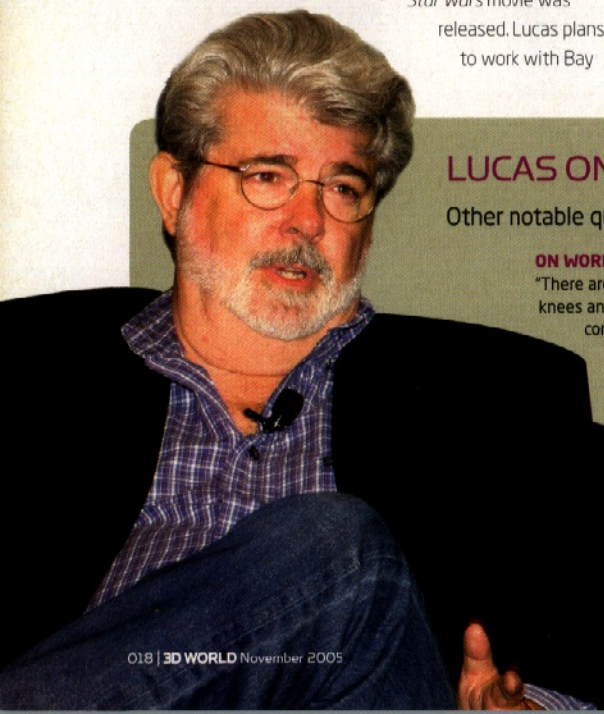
While the exact nature of these films remains confidential, Lucas did reveal that he aims to work on

"more esoteric" projects – or, as he put it, "more 'pure' filmmaking. Work that focuses on the quality of images."

Not that this means abandoning his most famous creation. Work is now underway on an animated TV series that fleshes out the basic history of the Clone Wars laid down in *Star Wars: Episode II* and *III*. To this end, Lucas is setting up a new studio in Singapore, a move he also described as "my chance to get a foot into anime."

In other words, die-hard fans can relax: the second trilogy of movies may be complete, but the story is far from over, and the characters undoubtedly remain alive in the mind of their creator. Or, as George Lucas himself puts it: "I'll never let go of *Star Wars*."

www.lucasarts.com, www.ilm.com



LUCAS ON ... | ... life, the digital universe and everything

Other notable quotes from George Lucas's SIGGRAPH keynote presentation

ON WORKING WITH RESEARCHERS

"There are a couple of times that they come back to me on hands and knees and ask me to lower the quality standard. And I do – I'm not completely ruthless." [Glancing across to the senior researchers from ILM] "Am I, guys?"

ON THE LORD OF THE RINGS TEAM

"Weta reminds me of us as we were two decades ago: a bunch of crazy guys stuffed in a closet. I said to Peter Jackson, 'Peter, you've got to come see ILM again and see what's in store for you in 20 years' time.'"

ON EDUCATION

"We're trying to bring learning into the

digital age. If I thought it was a hard job bringing the film world into the digital age – and this is an industry that had a hard time accepting sound – it's even harder with education."

ON DIGITAL TECHNOLOGY

"The real leap has been made. [Digital technology] is cumbersome; it doesn't always work as well as we'd like, but what's left to develop is mainly better knobs and whistles. We don't need to reinvent the wheel: we've already reinvented it."

ON THE FUTURE

[Closing the keynote presentation, to sustained applause from the show floor] "Doing art with a computer is the future. It's the 21st century. It is as important as anything that has happened in the history of mankind."

EVOLUTION MARCHES ON...

MAXON



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'9' tops Electronic Theater

AWARDS George Lucas may pull in the crowds, but the Electronic Theater heads everyone's 'must attend' list at SIGGRAPH. This year, Shane Acker's student short took the main prize



SIGGRAPH's Electronic Theater condenses the year's most impressive computer graphics eye candy into what is effectively a two-hour showreel.

As the 2005 Festival Chair, Samuel Lord Black, correctly surmised: "it presents a wonderful mix of science, humour, drama, excitement and music."

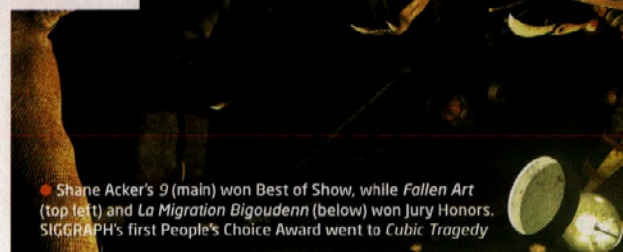
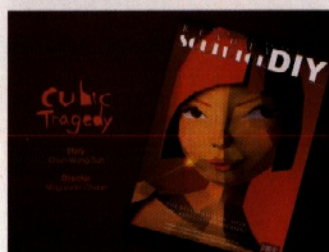
Independent filmmakers and students competed with the likes of Industrial Light & Magic, Digital Domain and DreamWorks, while scientific visualisation projects also made a strong contribution to the line up, which this year was projected in High Definition. The latter were contributed by the likes of the University of California, Berkeley; NASA; the National Center for Supercomputing Applications; and Sony Pictures Imageworks.

Black commented that he was "thrilled that student submissions continue to exceed [the jury's] expectations," evidenced by the fact that two of the three festival award winners were students.

Of these, Shane Acker's *9* won Best of Show. Black said: "The jury was amazed by the piece's multiple layers of complexity and detail. Acker not only carries a strong story idea in the film, but also directed the modelling, texturing, lighting and animation."

Acker used *Maya*, *Photoshop* and *After Effects* to create the short and explained that he "sought to immerse the audience in a gritty textural world inhabited by creatures composed of fabric scraps and bits of broken machinery."

La Migration Bigoudenn, directed by Eric Castaing, Alexandre Heboyan and Fafah Togora from Paris-based Gobelins, l'école de l'image, won Jury Honors. The short depicts a gathering of Brittany ladies competing in a crêpes cooking contest. Black described the nonphotorealistic style as "strikingly evocative of a strange alien world," and



● Shane Acker's *9* (main) won Best of Show, while *Fallen Art* (top left) and *La Migration Bigoudenn* (below) won Jury Honors. SIGGRAPH's first People's Choice Award went to *Cubic Tragedy*

commented that the film's "simplicity and brevity are goals that all filmmakers can meaningfully aspire to."

The third main award went to Tomek Baginski's *Fallen Art*, making Baginski the first two-time winner at the SIGGRAPH Computer Animation Festival after *The Cathedral* won Best Animated Short at SIGGRAPH 2002.

Black described *Fallen Art* as a "thought provoking" and "monumental film that takes us into the mind of a character who is creating art only for himself."

In the professional category, ILM revealed the sparse bluescreen stages behind the vast CG scenes of *Star Wars: Episode III - Revenge of the Sith*. Digital Domain presented a *Stealth* special, with most people agreeing the digital clouds were mind-blowing (even if the movie wasn't). And DreamWorks showed technical developments in *Madagascar*, including extreme character deformations and furry crowds.



Other highlights included on-screen 'hosts', Previs and Brainhead. The comic duo butted in between films, entertaining the audience with their nitwitted banter.

Cubic Tragedy also brought roars of laughter from all the animators in the auditorium. Created by Ming-Yuan Chuan of the National Taiwan University of Science and Technology, the short depicted a polygonal woman who attempts a self-facelift with her new cosmetic tools (for polygon modelling). She carefully adjusts her vertices but then gets carried away - unfortunately when she attempts to 'undo', the function only works once and she's left resembling a Picasso cubist masterpiece. The short went on to win SIGGRAPH's newly introduced People's Choice Award.

The animated formation and rhythmic march of *Dice*, directed by Hitoshi Akayama while studying at the Kyoto Seika University in Japan, was another audience favourite.

Other shorts that got the thumbs up were *Gopher Broke* from Jeff Fowler at Blur Studio, Chris Harding's *Learn Self Defense* and *Things That Go Bump in the Night* from Joshua Beveridge of the Ringling School of Art and Design.

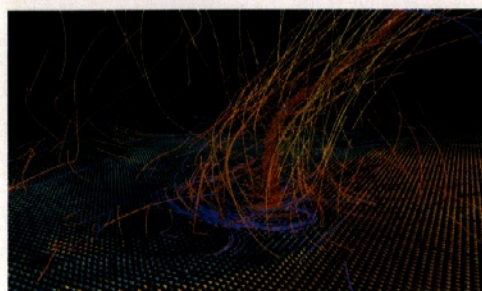
Student films *Overtime* and *Helium* also struck an emotional chord with the audience, while *East End Zombies* from Damian Hook at NCCA Bournemouth University was one of the more bizarre shorts.

www.siggraph.org/s2005/



"THE JURY WAS AMAZED BY 9'S MULTIPLE LAYERS OF COMPLEXITY AND DETAIL"

SAMUEL LORD BLACK, 2005 COMPUTER ANIMATION FESTIVAL CHAIR



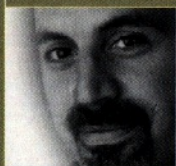
● Visualization of an F3 Tornado Within a Simulated Supercell Thunderstorm was among several scientific submissions



● *Helium*, directed by Adam Janeczek and Florian Durand of French animation school Supinfocom Arles, struck an emotional chord



Letter from Hollywood



Imagine going to a CG facility and saying: "If you give me \$250,000, I'll give you something that you can't bill your clients for. It won't make your images any better, at least not directly. It will probably make you more efficient, but I can't really prove that, because every job is unique." This would be a tough pitch to make, and yet such a world may be here.

Within the past year, several small companies have emerged that are trying to sell pipeline efficiency. And it may be that the world is ready to listen to what they have to say. Why would a company spend this money? There are many benefits: workflow is more efficient if everyone is using the same tools and the same standards; being able to back up to the version of the shot you did last Tuesday because the director has suddenly decided that it was the best option after all; not having to reinvent a particular effect, but instead reuse the one you did last year, and even better, be able to make it work again this year.

I would expect to get management information, such as: which artists are most efficient? How good are my estimates? How much capacity for new work do I really have? All of this is close to priceless. And system information: how much disk space do I really need? When and what should I archive? Is my render farm too big or too small? What is the utilisation of my licences? All of this translates into efficiency and more money.

Pipeline dreams

Craig Zerouni The 'hire more people, work longer hours' way of hitting tight deadlines isn't going to keep working, and so big companies are going to have to streamline their pipelines

Most companies have some kind of infrastructure that ties their pipelines together, and the larger ones have a fairly hefty investment in this internal software that stretches over many years. But the key question is, as always, what business are you in? If the answer is the beautiful custom image business, then why are you investing thousands of hours in writing acres of Perl scripts? In what way does this fit your natural advantages as a keen graphical eye with lots of technical CG chops?

The simple answer is that it doesn't. Just as it doesn't make sense to write your own word processor, it also doesn't make sense to reinvent pipeline, asset management, render queue management and management information systems software, just because you can. Leave that to the specialists and concentrate on what you know how to do. Interestingly, it seems that many companies are starting to agree with this idea.

I may be wrong, but I think that five years from now, the dividing line between the serious professional CG company and the rest will be the presence of some kind of asset management, production tracking system. You'll probably be able to get by without it, but production cycles are getting sillier and sillier. I've spoken to people who are expecting to do postproduction on a major effects feature in only three months, and many schedules are now less than 12 months.

The traditional way of dealing with this - stay up all night, hire lots of 'monkeys', freak out - isn't going to cut the mustard. Instead, companies will need to become efficient systems or they're not going to be able to keep up. This traditional approach to production management is going to have to give way in favour of something much more professional.

Autodesk

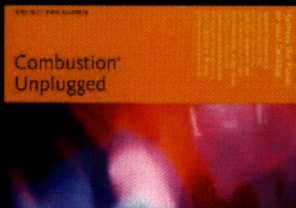
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Games industry smartens up?

ANALYSIS 3D World reviews SIGGRAPH's most hotly debated panel discussions and special sessions focusing on the development of true artificial intelligence in next-gen games **BY BRANT DREWERY**

While many of us may question George Lucas's abilities when it comes to scriptwriting, it would be unwise to ignore the man who brought us ILM, THX sound and nonlinear editing when he talks about interactive digital technology.

"What I want to get to is that point where you can talk to the game and the game will talk back. Then I think you can really get to the level of where cinema is in terms of telling stories," said the writer and creator of the *Star Wars* franchise in his keynote address at SIGGRAPH last month.

Like others in the games industry, Lucas says he's "rooting" for artificial intelligence, and if this year's SIGGRAPH is any indication, AI – or at least artificial semi-intelligence – is not only achievable, but also imminent.

Perhaps one of the closest projects in terms of what Lucas envisions comes in the form of *Façade*, a game described by designer and *Façade* co-creator Andrew Stern as part art, part research and part commercial prototype. But the game is hardly typical of so-called next-gen games. The characters and backgrounds are portrayed in simple 2D and the game lasts only 20 minutes. The premise is that the player acts as a guest invited to an arguing couple's apartment for dinner. "It's not about saving the world," said Stern. "It's about saving a marriage."

But the stylised graphics belie the real intent: *Façade* demonstrates how computer-driven characters can react in real time to unscripted, text-based inputs from the player.

Electronic Arts, meanwhile, has taken a very different tact. In its work on the latest edition of the boxing series, *Fight Night Round 3* for the upcoming PlayStation 3 and Xbox 360 consoles, EA's developers have spent considerable time and resources improving the in-game



graphics. The face of each boxer, explained EA Art Director, Frank Vitz, is made up of about 10 million polygons. But Vitz also pointed out that while creating details like realistic skin will go a long way towards making the characters appear more lifelike, the lower level, subtle and sometimes even subliminal human behaviours remain more elusive.

While Vitz said believable AI-driven characters are possible, one immediate and cost-effective solution will be to create the illusion of in-game character intelligence. "We're finding that

much of what is perceived by users to be intelligence in a game can be layered in procedurally with almost no AI at all," said Vitz. "If the computer-controlled character immediately frowns when he sees something unpleasant, glances around furtively when he's hiding or flinches when he hears a loud noise, [players] get the impression [the character] is thinking, when all that's happening in our system is the illusion of intelligence through a simple system of stimulus and response applied in a layered animation."



The games industry's challenge

ANALYSIS Just when the games industry thought it had achieved something close to realism, Masahiro Mori has to come along and spoil it all

Perhaps the most feared name in games development these days is Masahiro Mori. In the late 1970s, this robotist came up with the term 'Uncanny Valley', based on a theory of how real humans react to simulated ones. At the time, Mori was applying the theory to robots, but the Uncanny Valley has found new credence in the games industry, where the Holy Grail of realism seems just beyond grasp. Perhaps EA Art Director, Frank Vitz, explained Mori best while speaking as a SIGGRAPH panelist on 'Believable Characters: Are AI-driven Characters Possible And Where Will They Take Us?'. "The idea [of the Uncanny Valley]," said Vitz, "is that if we plot our emotional response to a given character against its similarity to a real human's appearance, movement and behaviour, the resulting curve is not the sure, steady, upward trend that you might expect. Instead, there's a peak shortly before you reach the level of a completely human look. Then

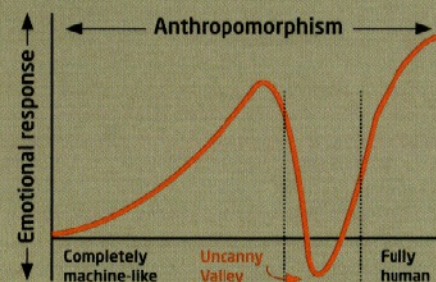
the curve dips down into a strongly negative response before rebounding into the hypothetical area where the resemblance to a human is complete."

In practical terms, this means that the closer animators get to photoreal characters, the higher a player's expectations are for a character's behaviour.

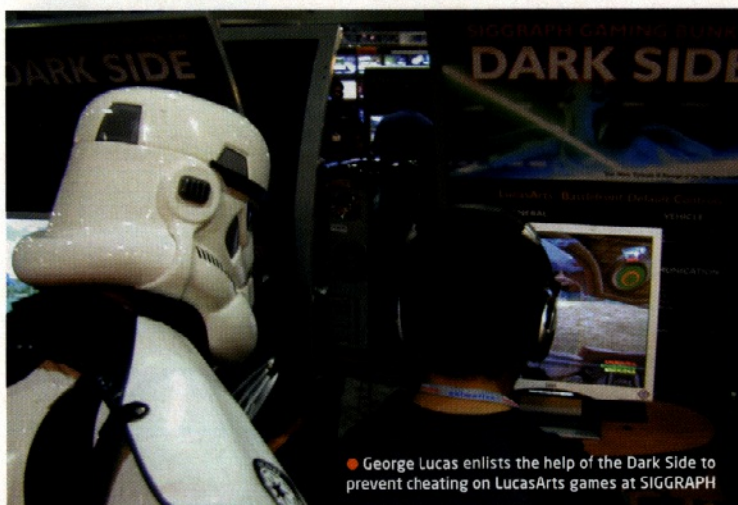
Looking at the work being done for the next-gen consoles indicates that the capability of near photorealistic characters is not just achievable, but has actually been done. However, Vitz said the industry is about to encounter the Valley due to the almost intangible behaviours that distinguish us as human.

"There are subtleties in the way humans move and act that are missing," Vitz said. "The result can be disturbing, even if you can't quite put a finger on what it is that you don't like."

With issues like this to resolve, it seems that the games industry had better prepare for a steep hike in Mori's Valley.



● Mori's 'Uncanny Valley' shows how our response to CG characters alters according to how realistic their appearance is



● George Lucas enlists the help of the Dark Side to prevent cheating on LucasArts games at SIGGRAPH



● The next-gen consoles promise greatly increased graphical realism. In EA's *Fight Night Round 3* (above), even skin pores are visible

Yet, even with these interim efforts, the reality, according to EA Animation Director, Eric Armstrong, is that despite the massive leap forward in terms of processing speed and graphics detail, it's unlikely that the next generation of consoles or PCs will be able to deliver the kind of AI consumers are coming to expect. "We tend to take about eight months [to create] a sports title. That's not a lot of time to research and develop really cool, high-end, super-smart AI, and I think the studios are aware of this weakness and are doing everything they can to [address

"WHAT I WANT TO GET TO IS THE POINT WHERE YOU CAN TALK TO THE GAME AND IT TALKS BACK"

GEORGE LUCAS, FOUNDER OF LUCASARTS

the issue] ... The cheap and easy thing to do is to make the visuals glossier, shinier and prettier. The hard thing to do is to write the code that makes for intelligent characters."

So will the next-gen games consoles mean better character AI? Andrew Stern, for one, isn't optimistic. "There are predictions that most of the general-purpose CPUs of these new [consoles] will be used up simply feeding the graphics rendering pipelines. So there may be even less leftover CPU for AI [in next-gen games]," said Stern. "I'm wondering if we're about to enter the 'big hair' era of games, where we have beautiful, real-time rendered hair that looks great, but with no mind behind it."

www.interactivestory.net
www.easports.com

EyeToy Tracker

HARDWARE Sony's Richard Marks is working on a way of tracking player movement, and heads are going to roll

While many developers struggle with heady issues like artificial intelligence, there are those in the games industry who get the fun task of developing interfaces to enhance the in-game experience. Richard Marks is one such person. He manages the Special Projects group for the Research and Development arm of Sony Computer Entertainment America. He was also a major contributor to the computer-mounted camera tracking system, EyeToy, which launched in 2003. He's now working on ways of implementing this revolutionary technology into existing games.

Among the work in progress is View Tracking, which Marks demonstrated at SIGGRAPH. The object is to enable a player to remain at a desk or on the couch while the EyeToy tracks the player's head movement and applies it to the so-called 'strafe right' and 'strafe left' keys. In a first-person shooter game, this technology would let players lean around virtual corners by physically moving their heads left or right. "It's something people do naturally, so we wanted to make use of it," explained Marks.

Until now, capabilities like this have been difficult to implement due to the power limitations of the existing consoles. "I think it would be unreasonable to expect some of the first-person shooters to use approximately 20 per cent of the CPU for [this feature]. But on the next-gen platforms, that will be less than one per cent."

Marks is also looking at ways of using the EyeToy, colour recognition software and passive objects, like the bright red c-shaped foam 'Clam' he used to grab and manipulate a rag doll-like character on-screen. The Clam was developed to recreate the video-searching technique that appeared in the movie *Minority Report*. Marks came up with the Clam as a way of avoiding the use of data gloves and other complex electronic peripherals that tend to scare away potential users.

www.eyetoy.com

PLAYING PHONE TAG

MOBILES More efficient graphics cards and longer-lasting batteries are about to ring in a new era of mobile gaming

IN TERMS OF games, the mobile phone market is perhaps the most complex and potentially lucrative. For service providers, it will mean larger billings. For phone manufacturers, it will mean a new range of phones. So what's holding up the process?

One reason, and also the most basic, is power consumption. Historically, energy-hungry graphics chips and insufficient power sources have conspired against mobile gaming products. But this has changed, said Callan McNally, Manager of ATI's 3D Applications Research Group. "I think getting some compelling gaming experiences on [phones] is going to be the next thing."

And if the industry's first hardware-enabled 3D gaming phone, the LG SV360 – announced in March this year and powered by ATI's Imageon 2300 media processor – is anything to go by, the next big thing is already here. The mobile phone certainly wowed the crowds at ATI's SIGGRAPH stand.



● The world's first 3D gaming phone, the LG SV360, has improved power and better graphics chips for mobile gaming

When the device is unfolded, the user has access to a small, colour, high-resolution (320x240) landscape LCD display, with images rendered at over 10,000 triangles per frame. There are also stereo speakers and standard game pad controls, as well as a gyroscope that enables the player to manipulate the 3D character on the screen by tilting the phone left, right, forward and back.

While the LG SV360 is currently only available in Korea, it seems as though mobile gaming has finally found its true calling.

www.lge.com
www.ati.com

CGarchitect.com awards

3D CONTEST Architectural visualisation industry applauds Neoscape and Zhu Tianyi from China



Design studio Neoscape took top honours in the Still Imagery and Animation categories at the Architectural 3D Awards organised by CGarchitect.com. Neoscape's

Proposed Restaurant Interior still and *LOFT 5* animation "broke free from the norm," said Lon Grohs, Director of Visualisation at Neoscape. "In the world of CG and architecture, there's a lot of similarity between visualisations, renderings, animation and approach. We wanted to do something atypical."

Referring to *LOFT 5*, a visualisation of a property in Las Vegas, Grohs said: "We wanted to redefine 'the virtual tour'. We wanted our visualisation to be very sensual and have a more film quality and cinematic feel. We wanted to showcase a real estate project that used animation to really sell it."

Using a combination of *3ds Max*, *form.Z*, *After Effects* and *Photoshop*, Neoscape worked closely with architectural and interior designers to develop their clients' initial design ideas into 3D models.

CGarchitect.com also held a parallel Architectural Visualization competition. Zhu Tianyi, a senior artist at BHAA in China, was awarded first place in a challenge that spanned five months.

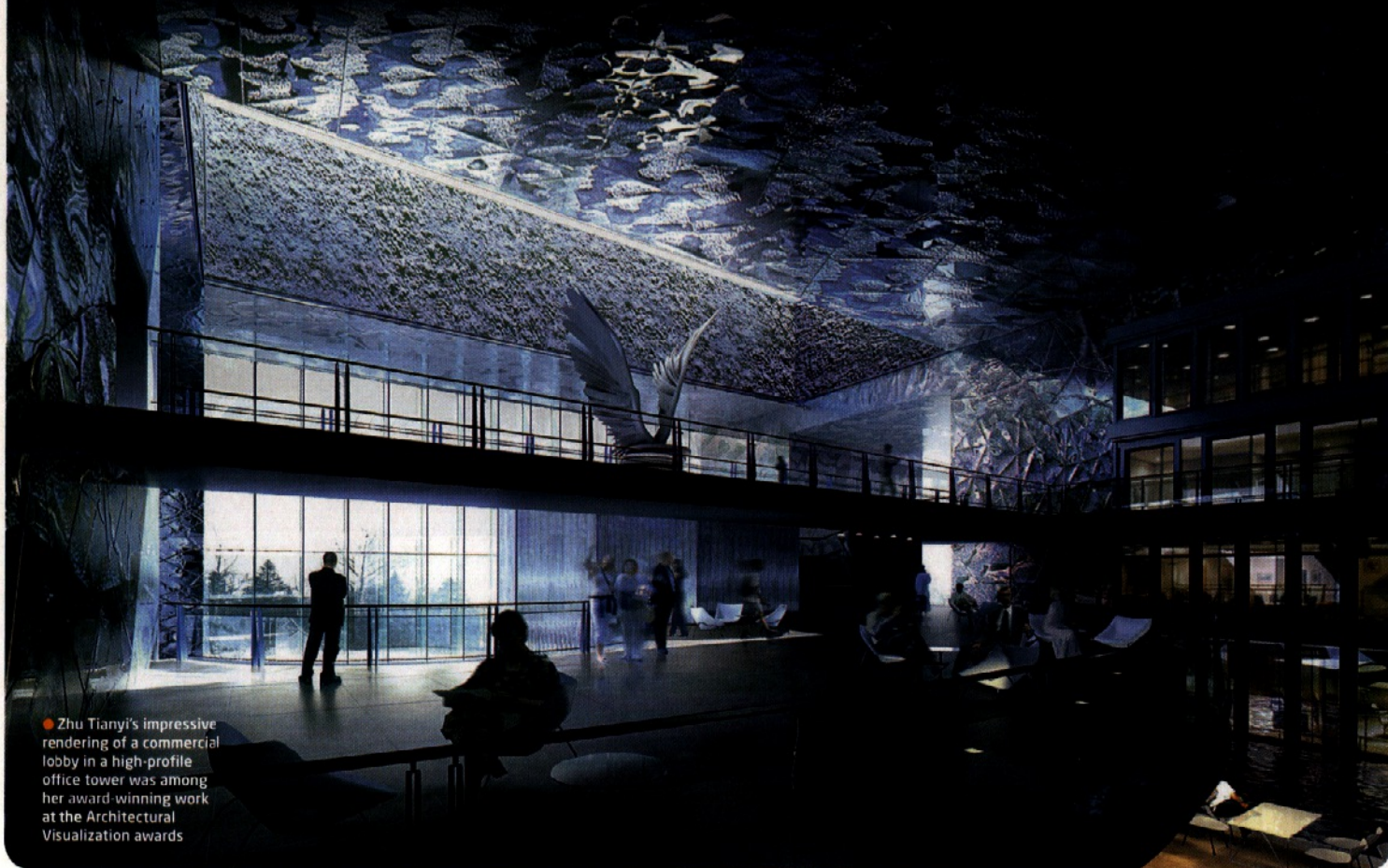
Competitors had to model and render an outside scene of a busy city centre, an interior scene of a commercial lobby, create a 20-second animation featuring one of these spaces, and also create a fully rendered night scene. Images were evaluated on creativity, lighting, modelling, texturing, composition, technical difficulty and overall impact, with the final award given to the contestant that demonstrated the broadest range of skills.

Zhu Tianyi, as well as the two runners-up in the competition, Olivier Campagne and Niall Browne, shared prizes valued at more than \$100,000 from hardware and software providers in the CG industry.

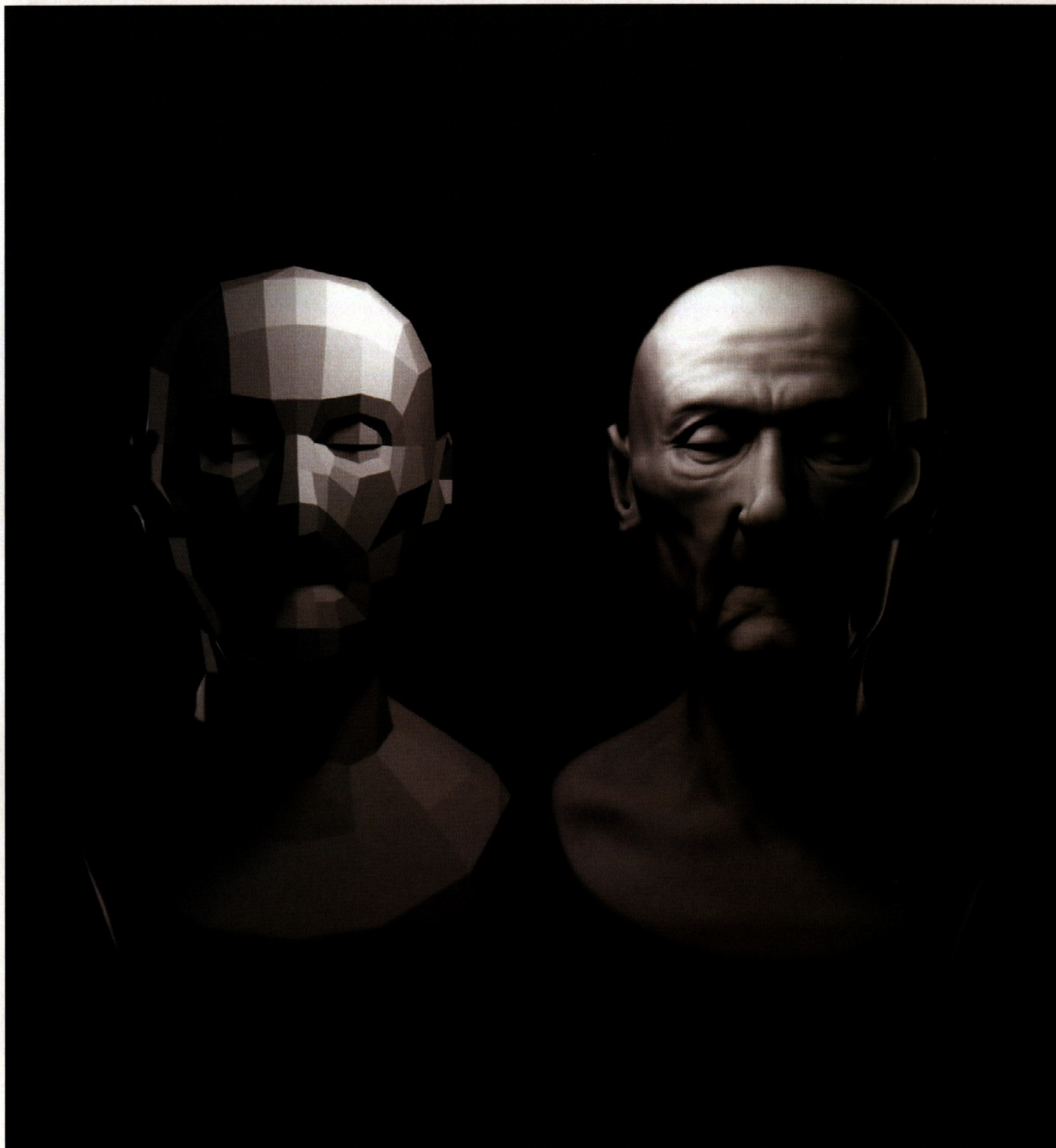
Alongside the winners, Neoscape co-founder Nils Norgren, and also Lon Grohs, picked up the CGarchitect.com 3D Awards trophy at the awards ceremony held during SIGGRAPH in Los Angeles.



● The idea behind the restaurant interior image was "to evoke a feeling and ambience that made the audience feel connected to it"



● Zhu Tianyi's impressive rendering of a commercial lobby in a high-profile office tower was among her award-winning work at the Architectural Visualization awards



Spot the Difference.

Escape Studios is a hub of 3D and visual effects expertise providing training, software and recruitment to the CG industries. Refinement of the above model took Escape's Scott Eaton two hours. 'Artistic Anatomy for Digital Artists' is his new masterclass that aims to enhance an artist's modelling ability, both in terms of speed and quality. Find out more about what's on offer at www.escapestudios.co.uk.



Escape Studios®

Projects round-up

This month: Gorillaz, jelly babies, jets, and a spot of horsing around

01 BOOTS AD CAMPAIGN

Ad agency Mother went to The Mill for effects on three Boots ads, produced using *Spirit*, *Flame*, *Maya*, *Softimage XSI* and *After Effects*. To morph a plant into a human, The Mill went old school: "We got Asylum 3D to make silicone models and used puppeteers. We combined them in *Flame* to make the transition from flower to girl," says *Flame* artist Barnsley. The studio illustrated the thinness of babies' skin with a CG baby: "Based on lighting tests using a prosthetic 'jelly baby', we developed a glowing skin colour which, when applied to the CG model, gave a translucent effect." www.the-mill.com

02 WHITTLE ENGINE

Emerging 3D animation studio Rendermedia has just finished animating a prototype of the Whittle jet engine for The History Channel. "It was important to achieve a realistic appearance for the documentary, but we had to simplify the engine for TV," explains Mark Miles, who founded his studio in 2003. "Using *3ds Max* and *Brazil*, we created the model and the particles and airflow for the animation. We added an outer casing to the engine to help viewers to visualise it in context." *Whittle - The Jet Pioneer* will air on The History Channel in October. www.rendermedia.co.uk

03 GORILLAZ' DARE PROMO

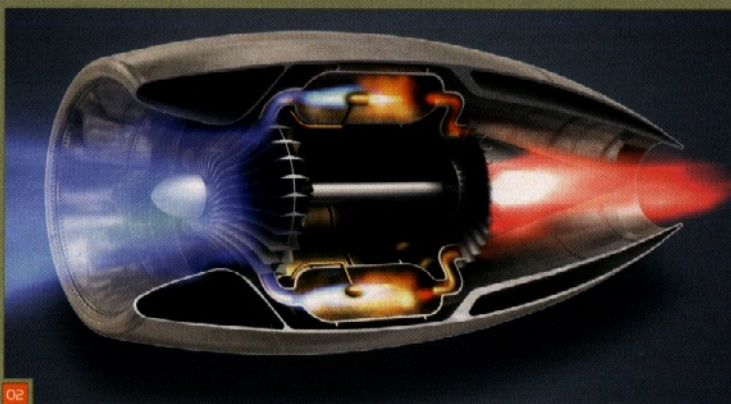
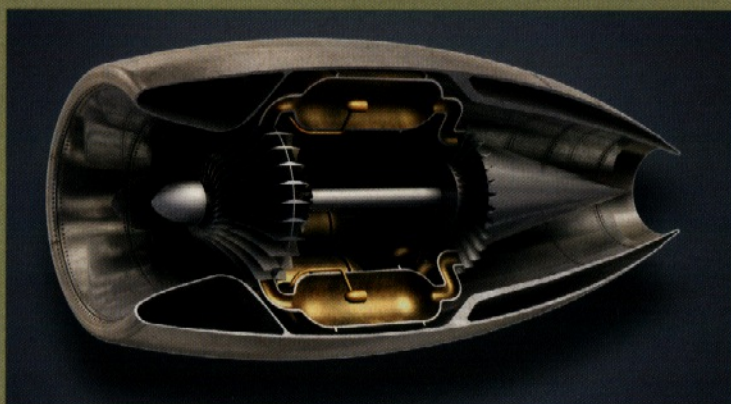
Dare was directed by Passion Pictures' Pete Candeland and Gorillaz' co-creator Jamie Hewlett. CG Coordinator Emma Phillips says: "All the characters were drawn and animated in 2D, and Shaun Ryder's head was live action footage. Everything else was CG, modelled and textured in *LightWave* in preparation for lighting. The scenes were given preliminary lighting to create atmosphere; secondary effects for the flashing lights of the machines were added later." The elements were composited using *After Effects*. Additional compositing was done by The Mill. www.passion-pictures.com

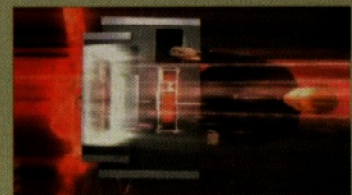
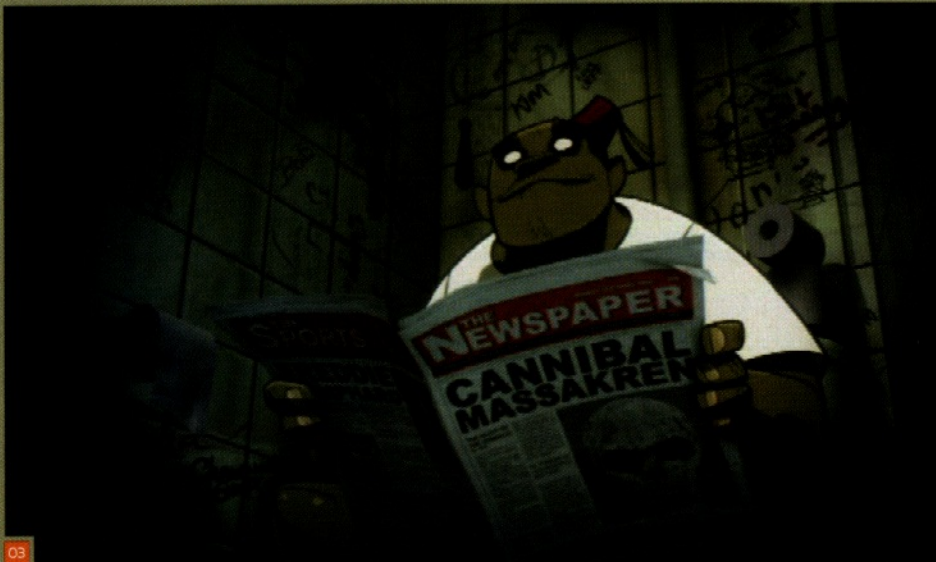
04 NETZERO'S 3G CAMPAIGN

To advertise the launch of NetZero's HiSpeed 3G Internet service, RIOT sent an office worker up into a 'cyberspace city'. "This was the biggest challenge - representing cyberspace," says Lead Compositor Claus Hansen. All environments are CG, from the office to the city. "We pulled textures from the NetZero logo and built them up in layers," explains animator Marcus LeVere. "We condensed all of the layers into one so the look is seamless. Many graphic elements were derived from real websites that were given dimensionality by the 3D team." www.rioting.com

05 GOLDFRAPP'S OOH LA LA VIDEO

Now for some glam rock, with Allison Goldfrapp riding a 3D mirrorball horse. Absolute Post's *Flame* artist, James Allen, explains: "Allison was shot on a rubber horse, but the movement wasn't authentic enough for the 3D model's animation, so live action material was used for reference. We used the saddle as tracking reference when stabilising the shot, and composited Allison on top. It was hard to match the movement of the actual reins with 3D reins - it took one and a half days of warping and animating in *Flame*!" www.absolutepost.co.uk





National perks

EMPLOYMENT Mountain biking, massages and moustache contests: how do the fringe benefits of your job stack up against those of staff at other studios around the world?

Your annual salary and healthcare benefits aren't the only reason for signing up with your chosen 3D studio. When you're working long hours against near-impossible deadlines, fringe benefits can make all the difference to your level of motivation.

From espresso machines and Friday socials to free massages and yoga, quality of life really matters. If the only break you get from your monitor is a 15-minute discussion of shader issues at a colleague's desk, you should seriously be reconsidering your employment conditions – you could be missing out on something important.

With George Lucas opening up his next-generation facility at The Presidio in San Francisco, featuring a day-care centre, full gymnasium and a beautiful 17-acre park, we thought we'd see how other companies around the world measure up. We talked to seven studios across the globe and quizzed them on all aspects of their company perks and office life. The cultural differences are striking, but then again, so are the similarities. In 3D, we like to have fun in our downtime, whether that's through karaoke nights or book clubs.

So what's your conclusion: is the grass really greener overseas, or are you better sticking with your current employer?

USA

COMPANY
The Orphanage

LOCATION
San Francisco, USA

AVERAGE DAILY TEMP
Summer 17°, winter 10°

SELECTED CREDITS
Sin City, *The Day After Tomorrow*

EMPLOYEES
130

CATERING
Catered monthly socials; beer and chips on Fridays

PERKS
Bowling, football, video game tournaments, fancy dress and pumpkin carving on Halloween; happy-hour wrap parties; and the Annual Moustache Competition for the coveted titles of Best Western, Frenchie, Peach Fuzz, Trash Stache (below) and Stache Tastic



UK

COMPANY
Cinesite

LOCATION
London, UK

AVERAGE DAILY TEMP
Summer 16°, winter 4°

SELECTED CREDITS
Alien Vs. Predator, *Charlie & The Chocolate Factory*

EMPLOYEES
169

CATERING
Always available; overtime dinners; special weekend breakfasts; and 'Cheeky Beers' on Fridays from 5.30pm

PERKS
Great parties, including *King Arthur's* wrap party at Kew Gardens; a fine art club (below); monthly film club; and a book club – appropriate, given the company's relocation to the former site of the British Library



S. AFRICA

COMPANY
Video Lab

LOCATION
Johannesburg, South Africa

AVERAGE DAILY TEMP
Summer 20°, winter 11°

SELECTED CREDITS
Hotel Rwanda, *Tsotsi*

EMPLOYEES
60

CATERING
All meals; bar after 5pm

PERKS
Mountain biking, go-carting, running and cricket clubs; parties where breakdancing is a speciality; fancy dress on Halloween, Valentine's Day and Spring Holiday. Regrettably, the masseur left after building up toxins from too much aromatherapy oil



NORWAY

COMPANY
Toxic Design Studio

LOCATION
Oslo, Norway

AVERAGE DAILY TEMP
Summer 15°, winter -3°

SELECTED CREDITS
Intro sequence to the Europride 2005 festival

EMPLOYEES
8

CATERING
Fully stocked kitchen and overtime dinners

PERKS
Value is placed on life outside of work; five weeks' annual holiday; working from home; free mobile phones; and bi-weekly massages



changing the face of 3D

CHINA

COMPANY

Hualong Film Digital Production Company

LOCATION

Beijing, China

AVERAGE DAILY TEMP

Summer 25°, winter -4°

SELECTED CREDITS

Green Nose, Ultraviolet

EMPLOYEES

120

CATERING

Dinners ordered in when on deadline

PERKS

Badminton, football and table tennis clubs; annual company party; karaoke nights; plus regular trips away when projects are wrapped up. These are not jollies in Blackpool - past trips have included horse back riding in Mongolia (below), a fishing weekend, and trekking the Great Wall of China



AUSTRALIA

COMPANY

Animal Logic

LOCATION

Sydney, Australia

AVERAGE DAILY TEMP

Summer 22°, winter 12°

SELECTED CREDITS

The Matrix Reloaded, House of Flying Daggers

EMPLOYEES

More than 350

CATERING

Free breakfasts; buffet lunch on Thursdays; monthly 'Animology' drinks; annual Family Fun Day and picnic

PERKS

Motorbike, football, basketball and scuba-diving clubs; twice-weekly kung fu classes taught by the Data Resource Manager; comedy nights; the Melbourne Cup Day hat competition; the 'Animal Art' in-house art gallery; and an annual Halloween party for US and Canadian ex-pats



INDIA

COMPANY

The FX Factory

LOCATION

Bollywood (Mumbai), India

AVERAGE DAILY TEMP

Summer 27°, winter 24°

SELECTED CREDITS

Abracadabra - The School of Magic, Ruby Duthy Hub Dub

EMPLOYEES

42

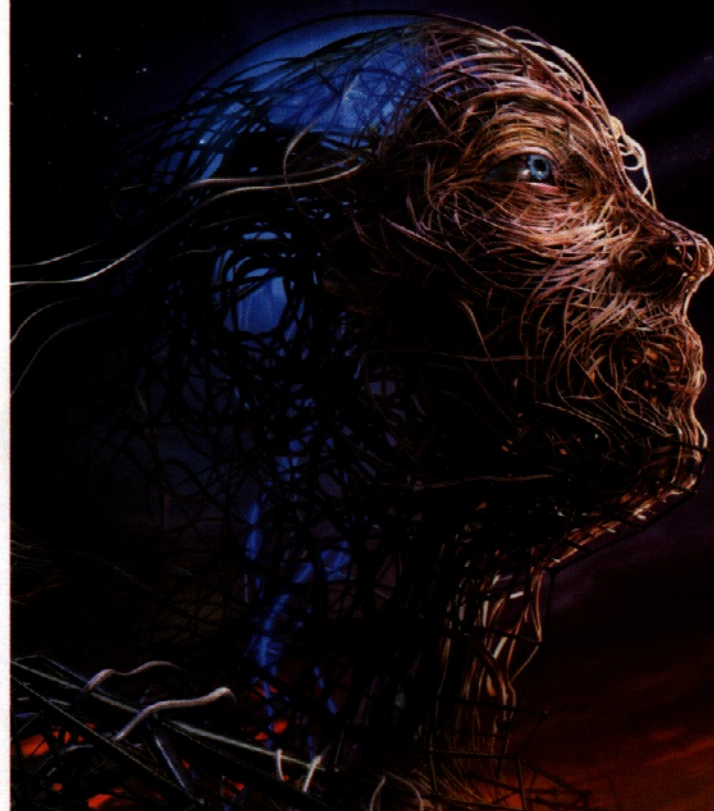
CATERING

Always when on deadline; occasional company picnics

PERKS

No hierarchy of employees; flexitime; daily Pranayam breathing exercises taught by the CEO; yoga; and free movie tickets for effects-heavy films

Illustration: Adam Benton



Maya® 7, the latest release of the award-winning 3D software, is packed with innovative new features allowing you to realise your creative vision faster and more easily than ever before.

Capitalising on Alias MotionBuilder® technology, Maya 7 makes character animation easier and more accurate. Other improvements such as advanced render layering and new modelling, texturing and effects tools help you achieve more with Maya.

To find out how the new and innovative features of Maya are changing the face of 3D, visit www.alias.com/maya7.

Maya™ 7

Alias® | www.alias.com

Image created by Meats Meats (www.3dartspace.com)

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LightWave 9 set for Q4 2005

SOFTWARE NewTek's R&D team must be in top gear, because hot on the heels of 8.5 comes LightWave 9

With two major updates between now and the end of the year, it's a busy time for *LightWave* users. Following yet more bug removal, feature additions and 64-bit support in *LightWave 8.5*, a complete, paid-for point release has also been scheduled for Q4 2005.

LW9 promises a whole raft of new tools and tweaks, not least of which is its star attraction – Adaptive Pixel Subdivision. This intelligent system generates subdivisions based on visibility and proximity to the camera, much like an LoD system, but it works across individual meshes. It's not the sub-poly displacement some users are asking for, but it's perhaps a step in the right direction.

Thanks to some core code changes, NewTek's developers have managed to extricate the renderer and implement some serious speed tweaks. Render times could drop on average by a factor of two, with certain scenes rendering at four or five times the usual speed. Additionally, the 64-bit version should be able to cope with 100-million-plus poly scenes.

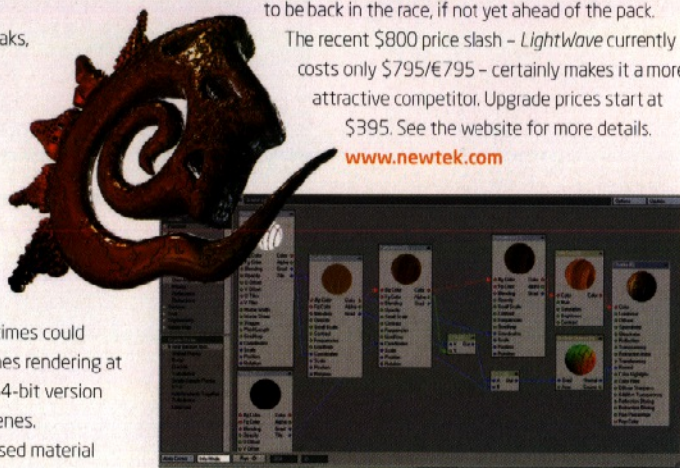
By popular demand, *LW9* also includes a node-based material editor. The existing layers-based system is still in evidence, but the nodal system enables power users to access deeper texture

functions. These procedurals will also be displayed in the OpenGL preview, thanks to new support for pixel shaders.

LightWave has had something of a torrid time since the release of the much-maligned version 8, but with a new team in place and some real innovation in the pipeline, NewTek does at least appear to be back in the race, if not yet ahead of the pack.

The recent \$800 price slash – *LightWave* currently costs only \$795/€795 – certainly makes it a more attractive competitor. Upgrade prices start at \$395. See the website for more details.

www.newtek.com



● Above: *LW9*'s node-based shader. Above left: This logo was rendered in 20 minutes on a single-processor machine with 37,734,680 polygons

PLUGGED IN

ILM EUROTOUR

ILM Technical Director Raul Essig is now on a whirlwind tour of Europe to talk about ILM's work on *Star Wars: Episode III: Revenge of the Sith* and *War of the Worlds*. Essig has been at ILM for over 10 years and specialises in particle systems, creating simulations for natural dynamics such as fire, smoke, tornados and sandstorms. Essig will be in Rome, London, Paris and Berlin from 13-16 September. Register on the Alias website.

www.alias.com



ENDORPHIN 2.5

SOFTWARE New features available in October

NATURALMOTION SHOWED ITS forthcoming release of *endorphin* 2.5 at SIGGRAPH and impressed onlookers with its new features.

CEO Torsten Reil said of version 2.5: "The Adaptive Behaviours are completely interactive. Characters can essentially animate themselves. If you were to move two football players in close proximity to one other, then one might automatically tackle the other one, maybe try to grab hold of his legs and realistically bring him down."

Reil added that the software enabled animators to direct scenes in real-time in a way never previously possible: "You can change parameters or change behaviours and see the results instantly."

endorphin 2.5's new Active Animation and Transition Events enable users to dynamically blend

from simulation back into moving animation data. New static balancing ensures characters stay on their feet autonomously, while there are also new features for faster custom character and rig set-up, plus crisper collisions.

endorphin 2.5 will be available from October and it costs from \$12,795 (£7,995/€11,995). A free learning edition is also available.

www.naturalmotion.com



● Now you can get more from your virtual stuntmen with *endorphin 2.5*



Alias MotionBuilder 7

SOFTWARE Alias touts new workflow and Maya integration

Alias has announced the first true new version of *MotionBuilder* since acquiring the character animation package from its original developer, Kaydara, last year.

"Most of [the changes are] about workflow, and doing things faster," revealed Alias Entertainment Channel Manager Andy Payne.

Productivity features include non-destructive animation layering tools and a Story Timeline performance environment, which are based on a real-time architecture. New character extensions (to swiftly augment a control rig with a tail, wing or prop) and visual feedback on rigs give animators greater control over their character setups.

Further enhancements include new save and load character animation features, enabling animators to quickly transfer, repurpose and reuse animation clips with any character. Other improvements are incremental backups and interface tweaks, including a new colour-coding system for keyframes and a 3D display option for handles, which means artists can create bounding boxes around objects for easy manipulation

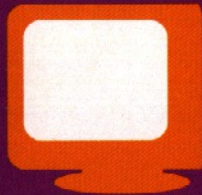
Integration with *Maya* has also been increased, with *Maya*'s single-chain IK and aim constraints included within *MotionBuilder*, and *MotionBuilder*'s full-body IK solver within *Maya 7*. However, Alias stressed that there was no plan to merge the two code bases completely. "You'll see a tie-in in technology between *Maya* and *MotionBuilder*," said Payne, "but they remain standalone products."

MotionBuilder 7 costs \$995 (£645/€895) for the Standard edition and from \$4,195 (£2,725/€3,875) for the Pro version.

www.alias.com



● *MotionBuilder 7* features new artist-friendly character interaction and manipulation capabilities



WEBSITE OF THE MONTH

www.laika.com/entertainment

Get a sneak preview of award-winning director Henry Selick's latest animated short film, *Moongirl*, before its release onto the international short film festival circuit.

Described as 'a charming fable which re-imagines lunar mythology', *Moongirl* is the first film output from LAIKA Entertainment, the newly formed studio launched after Phil Knight, Co-Founder and Chairman of Nike, acquired Vinton Studios.

Selick (*The Nightmare Before Christmas*, *James and the Giant Peach*) is now lined up to direct the CG/stop-motion animation feature film adaptation of Neil Gaiman's Hugo Award winning, internationally best-selling children's book, *Coraline*.

LAIKA Entertainment has launched an aggressive move into feature film development and production. Hot on the heels of *Coraline*, the studio also recently greenlit *Jack and Ben's Animated Adventure*, an original idea from LAIKA Entertainment's Director of Story, Jorgen Klubien, who has worked on projects with Pixar, Disney and Tim Burton's Skellington Studios.

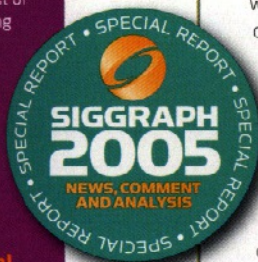
Further sites...

www.zaon.com/company/articles/3d_rendering.php

Zaon Studios has posted a useful article to help anyone in the midst of choosing appropriate 3D rendering application and software. Zaon states that the article helps "separate fact from fiction" and emphasises that "choosing the right renderer for your 3D needs is THE MOST important decision you will EVER make in 3D".

<http://graphics.ethz.ch/~brunoh/s2005.html>

View clips based on the research set out in Muller et al's recent paper 'Meshless Deformations Based on Shape Matching', which was presented at SIGGRAPH 2005. It provides a new approach for simulating deformable objects and could be of particular interest to those involved in games development. Physics programmers might also be tempted to implement the easy-to-code algorithm.



COSMIC BLOBS 1.1

SOFTWARE New 3D modelling program means kids can easily create, model and animate blobby characters

ASPIRING EIGHT-YEAR-OLD 3D

animators could jumpstart their careers by learning how to create their own models and animations in the latest version of the kid-friendly graphics package *Cosmic Blobs*.

The application is claimed to be the first to use easy pulling, pushing, bending, stretching, flattening and sculpting tools and techniques to create beautiful models out of Blobs, which are akin to digital modelling clay. Users can then decorate their inventions with colours, textures and decals before bringing them to life in an animation.

Various expansion packs are in development: *Critter Chaos* includes animal-themed models, textures, animations and background options, while *Knights and Castles* has a medieval theme. A holiday pack is also in the works, with the unconfirmed title *Extreme Vehicles and Adventures*. *Blobs 2.0* is also on the drawing board, with a release likely next year.

The original PC-only version, *Cosmic Blobs - Lab Rat Edition*, has already earned significant recognition, and it may surprise some of you that



● **Playful user interface and simple interaction: your kid's new pastime could prove a great way to decorate the fridge**

there's some serious state-of-the-art mathematics inside the software, which is linked to the creative brains of SolidWorks' Scott Harris and 3D mechanical design software company Dassault Systèmes. There are also rumours that the core technology behind *Cosmic Blobs* will be finding its way into professional products in the near future - the patents are pending.

Primarily targeting 7- to 14-year-old children, the PC/Mac version of *Cosmic Blobs 1.1* costs \$40 for the download or \$45 for the packaged version (about £25/£37). A free trial version of the software can also be downloaded from the website below. www.cosmicblobs.com

PLUGGED IN

SHORTS COMPO

Entries to Virtuality's 2005 Worldwide Student Competition for the Best Digital Short Video using Special Effects and/or 3D Animation must be received by 10 October 2005. Preference is given to works illustrating cutting-edge uses of technology, but artistic value will also be rewarded. The winners will be announced at Virtuality 2005, 3-6 November, in Turin. www.virtualityconference.it



BrightSide: the new black

HARDWARE New display promises to provide a much more accurate representation of visual effects work

BrightSide, formerly known as Sunnybrook Technologies, claims to have the world's first extreme dynamic range monitor on the market.

Mark Grist, VP of Business Development, said the new displays are 10 times brighter than conventional displays and have 100 times the contrast. Whereas traditional LCD monitors are constantly backlit, meaning blacks often appear grey, BrightSide monitors control the backlighting and produce truer dark tones. At the other side of the scale, imagery of bright, sunny days can be portrayed on the monitors with near eye-squinting realism.

The monitors are also capable of receiving 16-bit image data, as opposed to the usual eight bits of most monitors. This enables animators, researchers and scientists to see their data over a wider luminance range.

"This is important to the film post-production professional who wants to see all the fine gradients of an image as

it was originally captured on negative film," said Grist. "Negative film is high dynamic range, but when [VFX artists] work on monitors of low dynamic range, they can't see all the data that they captured."

BrightSide's research is anticipated to have consumer applications as well, although at around \$49,000 for its 37-inch widescreen monitor, it seems unlikely that the BrightSide brand will appear in living rooms soon. However, Grist said: "Brightness and contrast will be the new competitive landscape on which consumer companies will compete". BrightSide is apparently already involved in licensing discussions with several major consumer electronics companies which are interested in using its new technology. www.brightsidetech.com



● **Since low dynamic range images are used for print, the full dynamic range that the display is capable of won't be apparent in the image shown here**

Carlton Beer 'Big Ad'

Digital production company Animal Logic gets the drinks in with a surreal commercial for an Australian beer that's simply Massive

BY MARK RAMSHAW

DETAILS

TITLE

Carlton Beer 'Big Ad'

AGENCY

George Patterson Partners

PRODUCTION COMPANY

Plaza Films

DIRECTOR

Paul Middleditch

RUNNING TIME

60 seconds

FIRST BROADCAST

August 2005

WEBSITE

www.animallogic.com

TEAM SIZE

Up to nine in final two months (six 3D and three 2D)

TIME TAKEN

Four months

SOFTWARE USED

Maya, RenderMan, Massive, boujou

Proving that big really can be clever, the latest ad for Australia's Carlton beer spoofs the epic approach used in other campaigns by bringing thousands of robe-wearing beer drinkers together in a dramatic, widescreen collision of tightly choreographed chaos. With a sense of scale essential to the ad's humour, but with only 300 extras involved in the live shoot, Sydney-based visual effects facility Animal Logic was responsible for populating scenes with up to 15,000 of its own computer-generated cast.

"Right from the original brief, the intention was to use crowd simulation," says Animal Logic Visual Effects Supervisor Andrew Jackson. "The idea was to generate the entire crowd for all the helicopter shots using *Massive*, and then keep the shots at ground level live, with the camera below the shoulder so you don't see multiple layers of people. However, we did end up doubling them up on one shot, and doing crowd replication with greenscreen footage on the final shot."

Animal Logic has utilised *Massive*, the crowd-simulation software originally developed for use on *Lord of the Rings*, for a few projects in the past, but Jackson admits it's not normally considered an ideal tool when creating effects for commercials. "It's rare to be given enough time to deal with the delays with *Massive*'s slow turnaround, but here, we were able to arrange for a longer schedule using fewer people."

Massive can take several hours to resolve a crowd sim calculation, and because there's no easy way to preview results of such a complex simulation, it's only possible to check after rendering, and sometimes even doing a rough composite. "You're really dealing with one or two days between each iteration. And then you're usually stuck with that render, because it's hard to isolate a group in the crowd. For any changes, it's usually a case of running the simulation again."

"But one of the nice things about *Massive* is the randomness," continues Jackson. "In the shot right at the end of the commercial, a couple of the guys are actually running off in the wrong direction. We could have taken them out of the comp, but it looked quite funny."

In addition to crowd sim considerations, Animal Logic also had to carefully pre-viz all the live helicopter shots, taking into account altitude and lens types to determine how the crowd would need to move across the landscape. While the live plates were being filmed, the main film unit was busy shooting the real extras in the adjacent valley. "We also shot a little footage of about five of the extras from the helicopter, just to provide some reference material," says Jackson. "In addition, we photographed the robes to help match our cloth shaders, and used photos as the basis of the facial textures."

The character modelling and animation was created in *Maya*, with this data imported into *Massive*, and the results sent back again for lighting and then rendering with *RenderMan*. The studio uses its own *Mayaman* tool to integrate *Maya* with the renderer, and has also written further tools to integrate *Massive* into the pipeline. Tracking was carried out in *boujou*. "It was perfect for this job, all the ground texturing in the plates enabling it to work without any extra input at all."

One thing Jackson didn't bother using was chrome ball data. "It would have been hard to get one big enough to be relevant for the height we were shooting at, and the nature of the characters in the ad really makes them quite forgiving."

Instead, the team worked by eye to match CG-enhanced plates with those featuring the extras. "We went through all the live action shots and found similar angles to the ones we were working with. Then we'd scale to the same size, layer one over the other and tweak the shaders and compositing based on any visible differences."

Released onto the Internet two weeks prior to its broadcast debut, 'Big Ad' has proven enormously popular. "It's just one of those jobs where everything fell into place," says Jackson. "Right from the first meeting with the director and agency, watching the animatic created with pencil sketches set to music, it was really funny. Even at that point, you could see it was going to be huge."

Currently broadcast in Australia, the ad can be viewed in all its operatic glory at www.bigad.com.au

FREEZE FRAME

A man stands alone in a vast, grassy valley, a yellow cloak covering his generous frame. As he turns to the camera, opens his mouth and points to the horizon, a choir begins to soar. Next, we see the man flanked by a whole crowd of singers. "It's a big ad," they sing as they begin pacing across the valley. Cut to a crowd clad in red and blue, clearly on a collision course with the others. As the groups get closer, we see they're all in some kind of formation. An overhead shot finally reveals that one crowd has the shape of a glass of Carlton Beer, another resembles a giant man. Finally the yellow clad crowd 'pour' down into the 'stomach', the words "this ad better sell some bloody beer!" ringing out.



IN FOCUS | How Animal Logic turned a cast of just 300 into a cast of thousands

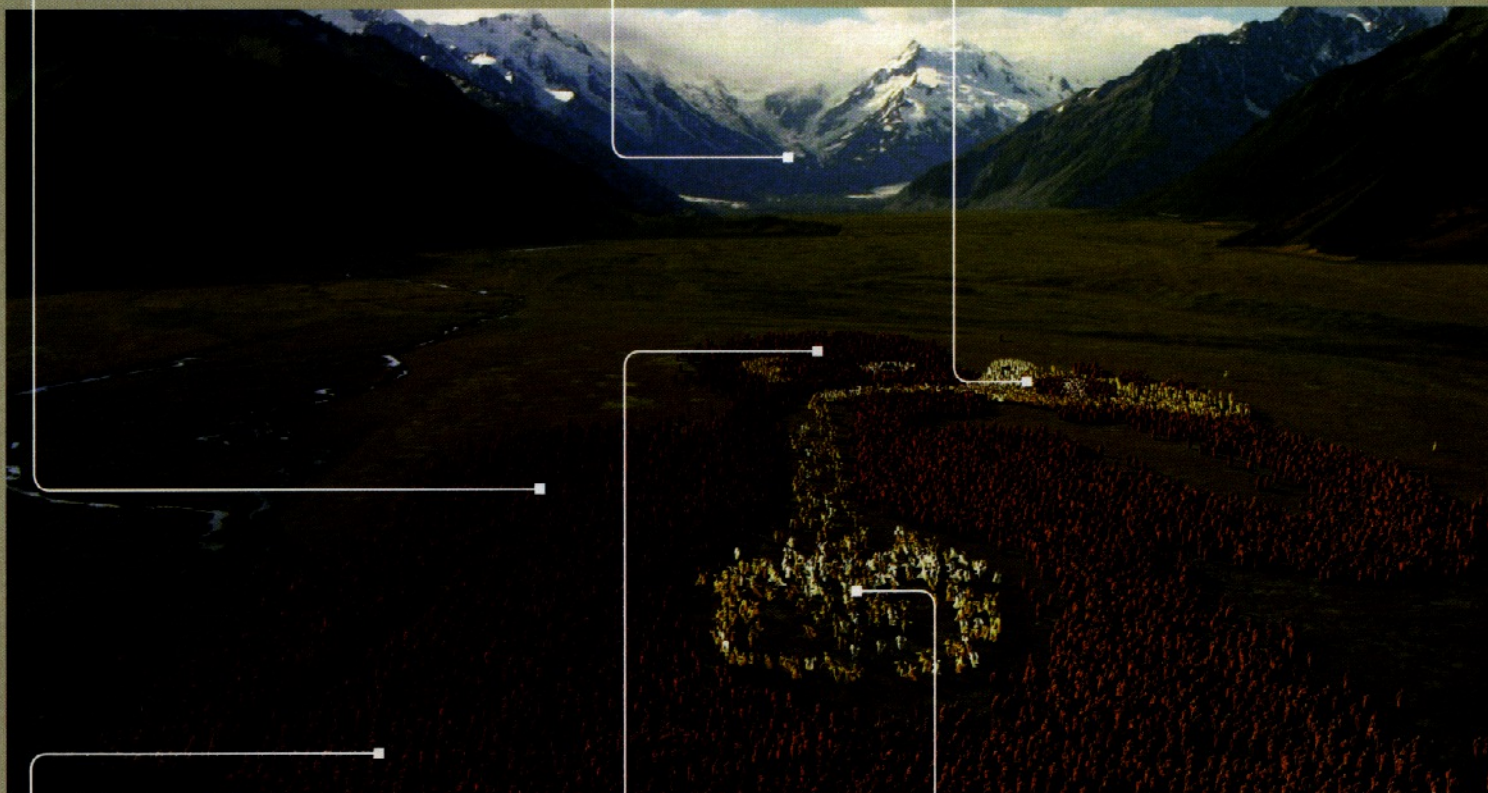


01 For the crowds, skinny, medium and fat models were built in *Maya*. "The models only have heads, hands and shoes," says VFX Supervisor Andrew Jackson. "There's no geometry for the bodies, just a *Massive* skeleton that we used to deform the cloth."

02 "The shoot went on for three days, with varying weather conditions, so we added clouds around the hills and placed some snowy mountains behind," says Jackson. "All the mountains are CG, created with a photo taken from much higher up."



03 "Keeping the poly count as low as possible made a huge difference to the number of agents we could put in a scene," says Jackson. "We used 1,000 for each character's robe and 700 for the body parts, enabling us to render the lot in one go."



04 "*Massive* is designed for realistic crowd behaviours, but we needed them to hold recognisable shapes ... as soon as they start to run around, the shape breaks up quickly. The legibility of the company logo was a big issue!"

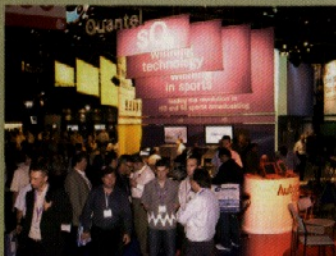
05 *Massive* has its own cloth simulation, used for the foreground characters. "For the others, we didn't use a cloth simulation as such - it's effectively a skin draped over the skeleton," explains Jackson.



06 The characters were animated using a variety of basic movement loops. "We had a basic walk, a run and various other cycles, including one for shuffling and one to show them idling. Then there's also one for the beer dance at the end."



EVENT HORIZON



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www.ibc.org



OTTAWA INTERNATIONAL ANIMATION FESTIVAL
21-25 SEPT, OTTAWA, CANADA
Along with screenings, OIAF 05 presents workshops, retrospectives, a forum, trade show and career day. Animation director Rob Coleman also discusses the creation of Yoda.
www.awn.com/ottawa



MOBILE ENTERTAINMENT SUMMIT 26 SEPT, SAN FRANCISCO, US
Trends in mobile content and applications are under discussion by speakers from AT&T, Fox Mobile Entertainment and Havok, alongside the wireless handheld pros.
www.ihollywoodforum.com



EDIT 2005 9-11 OCT, FRANKFURT, GERMANY
The EDIT show provides an annual insight into tricks, tools and trends for filmmakers. Phil Tippett is among the speakers, while 'Artificial Humans' is the theme for the 30-second film competition for young talent.
www.edit-frankfurt.de

Rushes Soho Shorts

SHOW REPORT This year's Rushes Soho Shorts Festival saw record numbers of entries and visitors, and as the reputation of the show soared, plans for it to tour the world were revealed

Proving itself a prominent frontrunner in the international short film festival circuit, the Rushes Soho Shorts Festival is garnering interest far beyond London's West End. This year, the festival joined forces with Vue Cinemas, enabling screenings of shortlisted films to take place not only within Soho, but also in the 'Boho districts' of Shepherd's Bush and Islington, as well in cinemas as far afield as Birmingham, Cambridge and Edinburgh. Film festivals around the world have also started screening the shortlisted films, and plans are underway to tour internationally.

In the Vue Animated Short Award category, *Overtime* (already a firm favourite on the festival circuit), from directors Oury Atlan, Thibaut Berland and Damien Ferrié of Supinfocom, took the top accolade this year. The runners-up were *City Paradise*, directed by Gaëlle Denis at Passion Pictures, and *Maestro*, by Géza M Tóth at Kedd Ltd.

Atlan has since paired up with former Supinfocom student Thomas Bernos (director of *Hernando*) and formed Oury and Thomas. The directing duo are represented by Partizan Lab, the animation division of the London/Paris-based commercials firm Partizan, and they are currently working on music videos and commercials together, as well as their own personal projects.

A record-breaking 1,900 short films, newcomer films, music videos, title sequences and idents were entered into this year's Rushes Soho Shorts Festival, with screenings of the shortlisted films taking place in cafes, bars and screening rooms all over Soho for an audience of several thousand people. Among the judges were creative guru Trevor Beattie, Paul Rothwell from commercials production company Gorgeous Enterprises, Paul Trijbits from the UK Film Council and *3D World's* very own editor, Jim Thacker.
www.sohoshorts.com



● Director Gaëlle Denis needed real people for *City Paradise*, saying: "Animation is beautiful, but sometimes cold emotionally"



● Created using *3ds Max*, *Combustion*, *Photoshop* and *Premiere*, Supinfocom's *Overtime* has picked up a number of show awards

Production line

The month's other releases in brief



TURTLE 2 FOR MAYA
Illuminate Labs' next-generation *Turtle 2* photorealistic renderer for studios with *Maya* pipelines is now shipping. Users can open and render vast scenes with advanced lighting effects at very high speeds. Licences start from \$999.
www.illuminateilabs.com



FUSION 5
Fusion fans have waited three years for this compositing and visual effects software. Packed with features and workflow enhancements, the 64-bit-ready application has already been snapped up by Santa Monica-based effects house RIOT. It costs \$4,995.
www.eyegonline.com



QUBE! 4
Qube! 4 offers batch queuing, distributed processing and advanced render farm management, together with diagnostics tools. The system prioritises and accelerates rendering and compositing jobs and minimises wait times for artists. It costs \$250 per CPU.
www.pipelinefx.com



POWER NURBS
nPower Software's hybrid surface and solid modelling platform offers *3ds Max* and *VIZ* users fine control over the transitions between sections of a model. Based on the SOLIDS++ kernel, it costs \$895 and handles even the most difficult industrial modelling tasks.
www.npowersoftware.com

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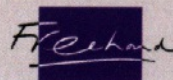
"ZBrush's **unique** and **intuitive** tools allow me to **create** complex and **detailed** creature designs that couldn't have been achieved any other way, as swiftly or **precisely**."

Caroline Delen



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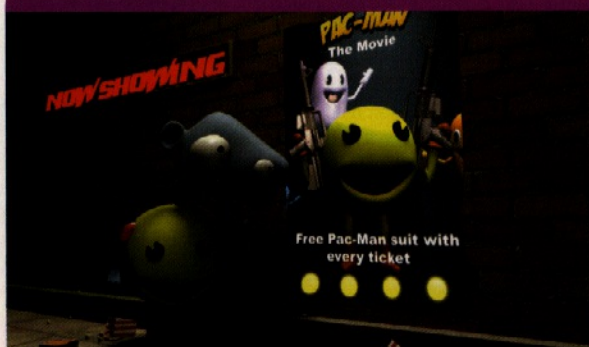


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MeNTaL RoY

Fresh from a stint battling clients who think that Paint Effects are something that happen when you get Laurence and Vivian to rag-roll your faux-Tuscan dining area, **Mental Roy** vents his spleen on game-to-movie conversions



THEY'RE MAKING *Doom* into a movie. I'm sorry, let me rephrase that. Break off my arms and beat me to death with the wet ends, **THEY'RE MAKING F*CKING DOOM INTO A F*CKING MOVIE!**

Now, people have been turning computer games into movies for at least 10 years. The resulting hall of shame includes such gems as *Street Fighter*, *Mortal Kombat*, *Resident Evil*, *Super Mario Bros.*, *House of the Dead*, *Alone in the Dark*, *Lara Croft: Tomb Raider*, and, in a fit of inspiration, *Lara Croft: Tomb Raider: The Cradle of Life*. (Legend has it that on fine days during the pitching process, the sound of barrels being scraped could be heard as far afield as Orange County and San Bernadino.)

These are not accidentally inept movies. On the contrary, some of them were produced by major Hollywood studios, by experienced production teams, on reasonable budgets, using casts of A-list Hollywood actors. And yet they were all, utterly and irredeemably, shite.

You want evidence? Consider this fact: of the list above, three of its members - that is, approximately a third of the best-known recorded output in this genre - are included in the Internet Movie Database's 'Bottom 100'. To make it onto this list, you don't need to be any old dross. Oh no. Far from it. On the contrary, you need at least 625 of the cinema-going public to have voted you a worse movie than *Frankenhooker*. Or *Transylvania 6 5000*. Or *The Killer Shrews*. I could go on, but that would be gratuitous and cruel ... oh, what the hell. You also need to be worse than *Howling III: The Marsupials*, *Cannibal Women in the Avocado Jungle of Death*, *Bats*, *Jesus Christ Vampire Slayer*, and at least three films starring Steven Seagal.

The reason for this atrocity exhibition is simple: none of the games that have been turned into movies have decent plots. And, contrary to popular belief, some games do have plots. *Deus Ex*, if you can ignore the ludicrous cod-philosophising, was a smart, modern conspiracy thriller. *Grand Theft Auto: Vice City* was a sprawling urban epic. Even twee tights-and-trollslaying epic *Baldur's Gate* had more twists than a weasel in a blender.

None of these are particularly obscure titles. They all sold by the bucketload, went on to spawn sequels and featured on most critics' end-of-year lists. Yet each of them was passed over for adaptation in favour of *Double Dragon*. (OK, I know that Columbia has optioned a *Deus Ex* movie, but it appears to be stuck in development hell.) There can only be two possible explanations for this: one, that cigar-chewing Hollywood execs have never heard of any computer game outside of the '*Heroes of Mutilation and Mayhem*' mould, or two, they think that the cud-chewing multiplex cattle haven't. I don't know which is the more depressing.

And, yet again, it's 3D artists that will carry the can. We produce the original source material and it falls to us to paper over the plot holes with visual effects when the movie adaptation emerges to block up the autumn release schedules, like a stool in a constipation-sufferer's colon. In the minds of the movie-going public, IT'S OUR FAULT.

So if you're an aspiring visual effects professional thinking of working on an upcoming game-to-film franchise 'cough' *Halo* 'cough', please, please, think again. You may love the original Xbox version and the script may be penned by Alex Garland, but the chances are that when it comes out, the audience will still vote it a worse movie than *Attack of the Mushroom People*. And that's even without Uwe Boll at the helm ...

EVEN TWEE TIGHTS-AND-TROLLSLAYING EPIC BALDUR'S GATE HAD MORE TWISTS THAN A WEASEL IN A BLENDER

PLUGGED IN

ANIMEX SHOW

The 1 October deadline for submissions to the Animex Student Animation Awards is fast approaching. Last year, over 450 entries were received from student animators and games developers. Awards for Visualisation and Motion Graphics have been added to this year's line-up. The festival is organised by the University of Teesside and will be held in Middlesbrough from 6-10 Feb 2006.

www.animex.net/awards



GLOBAL ILLUMINATION #06

Key stats and trends from the 3D industry in specific countries. This issue: **Vietnam**

The cost of labour in Vietnam is one of the lowest in the world. Coupled with a sizeable pool of skilled animators, this is attracting animation outsourcing to the country. In addition, Vietnam has a highly literate population, with a large proportion of the population in the 25-30 age bracket.

The industry suffers from the lack of an advanced telecommunications infrastructure, which has resulted in limited broadband connectivity. The leading animation studio in Vietnam is Glass Egg Digital Media, whose key clients include Disney, EA, Nintendo and Warner Bros. Animation studios are engaging in 2D and 3D animation and computer-generated visual effects in their productions. Most of the animation content produced here is exported with very little local

content. As a result, the Vietnamese TV channels are reliant on imported animation content, and the most popular animation programmes include a large number of Hollywood productions and Japanese animation.

These statistics were provided by Digital Vector, a research and consultancy firm providing reports on aspects of the global animation industry. Visit www.digital-vector.com to find out more.

There are around 50 animation studios in Vietnam

The Vietnam animation industry is growing at about 25% per annum, and the growth is driven by animation outsourcing from North America and Europe

The Vietnam animation industry is concentrated around the city of Ho Chi Minh (former Saigon)

The cost of completing animation projects in Vietnam is about 30% less than the cost of getting the work done in the US





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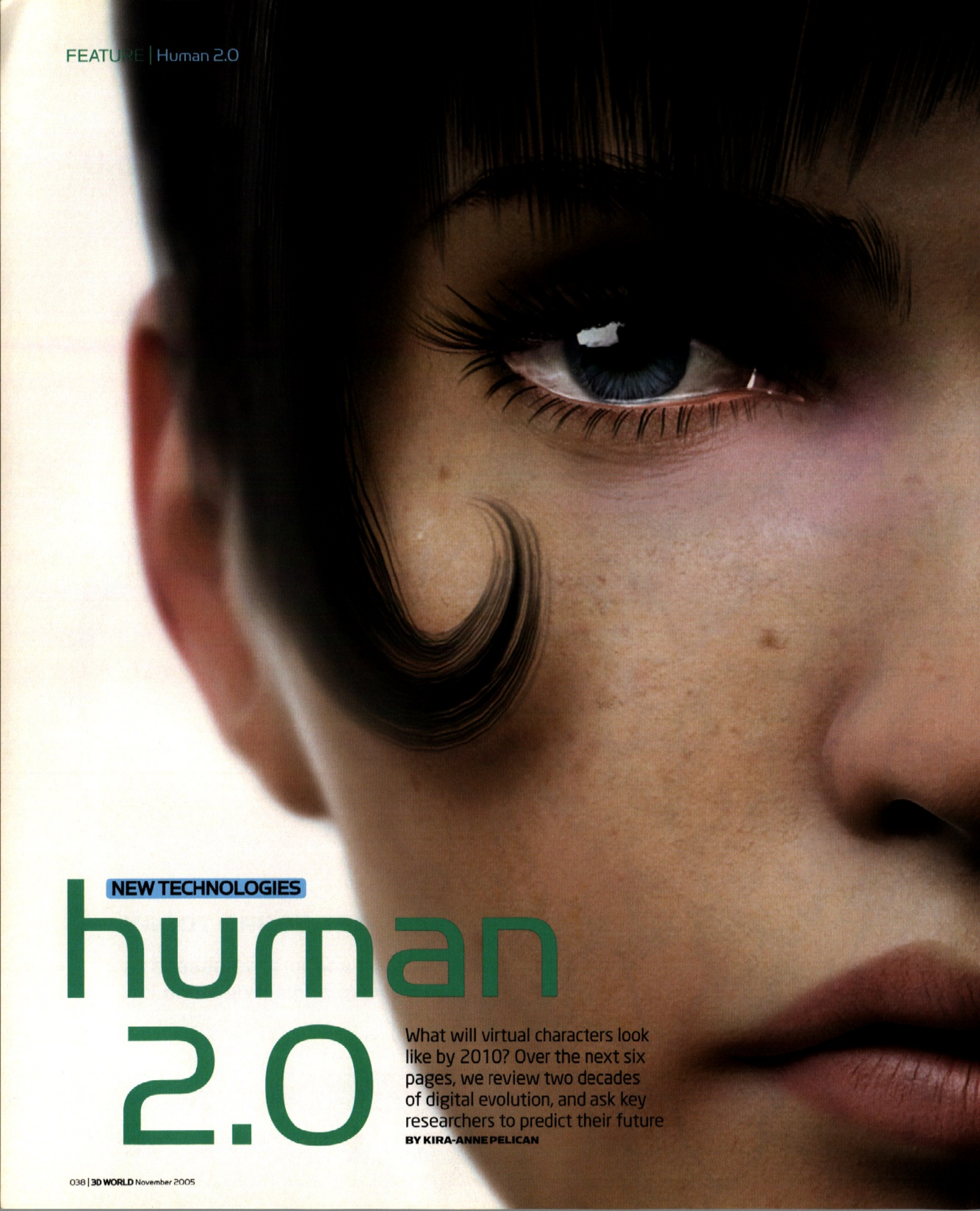
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Avid
computer graphics

A close-up, high-contrast photograph of a person's face, focusing on the eye area. The person has dark hair and is looking slightly to the right. A digital, blue, pixelated eye is superimposed over the person's right eye, creating a fusion of human and machine. The lighting is dramatic, with strong highlights and deep shadows.

NEW TECHNOLOGIES

human 2.0

What will virtual characters look like by 2010? Over the next six pages, we review two decades of digital evolution, and ask key researchers to predict their future
BY KIRA-ANNE PELICAN



Twenty years ago, on *Young Sherlock Holmes*, a knight leapt from a stained glass window and a new age dawned. We knew, immediately, to expect great things for the future of this first fully 3D digital human, and the rapid learning curve towards photorealism began. Industrial Light & Magic's morphing 'pseudopod' followed, with *The Abyss* (1989). Using cyberscans of Mary Elizabeth Mastrantonio, the water creature took a first stab at digitally cloning a real-world human when it mimicked her facial expressions.

With rapid developments in technology, and ever-increasing processor speeds, the next decade saw a flurry of virtual characters. 1990 marked the first recorded attempt to use motion capture in a feature film. In *Total Recall*, the attempt failed, but was successful two years later in *Lawnmower Man*.

● Realistic eyes are a major current area of research. For *The Polar Express*, Sony Pictures Imageworks even modelled a meniscus that could be dialled in

where early motion capture systems, limited in speed and resolution, gathered basic body motion. By 1991, the quicksilver T-1000 strode onto our screens in *Terminator 2: Judgement Day*. Using new morphing techniques developed at ILM, the T-1000 was able to morph into any person or object. A couple of years later, we saw the first digital doubles in *Jurassic Park* (1993), but they were only briefly onscreen before being devoured by Oscar-winning Dennis Muren's dinosaurs. These were the first examples of CG characters with skin, muscles and texture. By the middle of the decade, game characters, previously the visual

THE NEXT BIG THING | Intelligent facial capture

THE BIG IDEA Using motion capture to reconstruct what is really going on beneath the surface of the face. Facial mo-cap data is used to drive an accurate rig of bones, muscles and soft tissue.

WHO'S WORKING ON IT? Stanford Computer Science Department.

WHAT DOES IT INVOLVE? Scanning and medical MRI data is used to build a detailed facial model, including bones, muscles and soft tissue. Motion capture cameras then track marker positions on the source actor's face during a performance. Ron Fedkiw, Assistant Professor, explains: "The real innovation is in the use of a new algorithm that determines which muscle activations make the digital face model match the motion capture marker positions. We actually design a fully animated face model and use motion capture data to try and determine parameters to drive it."

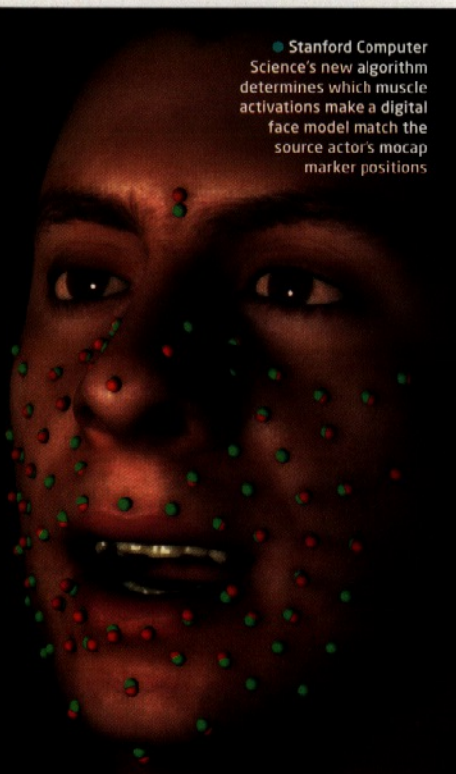
PROS Accuracy, and a model that can only do what a real face is physically capable of.

CONS Acquiring data with sufficient resolution has proved tricky. Fedkiw's team are working to find better MRI and higher-resolution motion capture technology to get a more accurate look at the muscles of the face.

IN ONE YEAR Used in feature films.

IN FIVE YEARS "This will be a revolution in the facial animation graphics and vision communities - a big one," says Fedkiw.

● Stanford Computer Science's new algorithm determines which muscle activations make a digital face model match the source actor's mocap marker positions



● Another solution is to use real-world data. EA's *Fight Night Round 3* demo combines digital cloning techniques with real-time rendering

effects industry's poorer cousins, were also making great leaps forward. Rapid improvements in graphics hardware rendered *Quake*'s hundreds-of-poly characters impressive in comparison with historical 2D sprites. By 1996, Lara Croft, one of 3D gaming's first true personalities, bounded across our screens, while over in Japan, Square popularised fully rendered game characters and near-film-quality full motion video in *Final Fantasy VII*.

Back in Hollywood, as the industries were converging, the next great leap forward was through the population of the *Titanic* (1997) by thousands of digital extras, all animated with motion capture data. The following year, PDI broke new ground with the development of crowd management systems and muscle-based facial tools on its entirely CG feature, *Antz*. ILM was, meanwhile, developing its motion capture technology, which when combined with procedural and keyframed animation, produced the grotesque decaying flesh, sinew and organs of *The Mummy's* Imhotep. The century wrapped with the brash spectacle that was *Star Wars: Episode I - The Phantom Menace* featuring lead CG characters, Jar Jar Binks, and thousands of digital extras.

"MOCAP IS ONLY THE CAPTURE OF MOVEMENTS. WHAT NEEDS TO BE CAPTURED IS PERFORMANCE"

ED HOOKS, AUTHOR OF 'ACTING FOR ANIMATORS'

Final Fantasy: The Spirits Within (2001) achieved a level of stylised realism in its human characters not seen before. Synthetic human actors were, for the first time, given roles that could easily have been played by real humans. Motion capture was used to animate the key characters' bodies, while facial and hand animation was keyframed. One of the most ambitious films of its time, it failed to win over its audience. Ed Hooks, author of *Acting for Animators*, says: "Mocap is the capture of movements. What needs to be captured is performance." That wasn't going to happen until we saw Gollum, arguably the first CG character with spirit, in *The Lord of the Rings* trilogy.

FACIAL CLONING

A big breakthrough in skin shader technology came with the development of subsurface scattering (SSS), as seen in *The Lord*

of the *Rings: The Two Towers* (2002). Until then, human skin had tended to look harsh and opaque. Subsurface scattering is a method of simulating skin translucency through the emulation of the scattering of light particles that penetrate the skin. Used to spectacular effect with *Gollum*, the technology won an Academy Award for Technical Achievement. His creators at Weta weren't alone in recognising the potential of the technique, and SSS has since been used as a staple on countless films.

The team at Sony Pictures Imageworks took a different route on *Spider-Man 2* (2004) when creating the photorealistic digital double of Doc Ock. Rather than using subsurface scattering techniques, they used the Light Stage system developed by Paul Debevec at USC's Institute of Creative Technology. Through high-resolution photography, the reflectance field of Alfred Molina's face was captured and, with the resulting images, Doc Ock's face

"EYES AREN'T JUST THE WINDOWS OF THE SOUL – THEY'RE THE PART OF THE HUMAN FACE TO WHICH YOUR OWN EYE GOES FIRST"

ROB BREDOW, DIGITAL EFFECTS SUPERVISOR, SPI

was reconstructed from any given angle, and under any lighting condition, to Academy Award-winning effect.

For *The Matrix Revolutions* (2003), George Borshukov's team at ESC Entertainment faced the challenge of creating a 'superpunch' – the final punch that Neo delivers to Agent Smith – deforming his face in a startling, exaggerated fashion, and captured by a close-up camera move. Borshukov's team created the shot entirely in 3D using the Universal Capture marker-free motion capture technology it had been perfecting over the previous three years. Because its audience would be well acquainted with Hugo Weaving's face, his digital clone needed to be incredibly accurate. High-Definition footage of Weaving's performance was captured from multiple angles. Using the 3D 'optical flow' data, the video-captured images could be reconstructed before being viewed from new camera angles under different lighting conditions. "Additional facial animations were created by hand, and the skin was rendered using approximations to the subsurface scattering technique," explains Borshukov. The combination of technical innovation and visual artistry enabled Agent Smith's photoreal digital clone to convincingly perform on the big screen.

FULL BODY AND FACIAL CAPTURE

The Polar Express (2004) utilised the most complicated motion capture set-up seen on our screens to date. While the movie looks like an animated 3D feature, Robert Zemeckis actually directed his actors' performances as he would for a live-action film. Motion was captured on three stages: a large 60x25ft area where 120 cameras captured full body data for blocking shots. A second stage was used for stunt work, and finally a 10x10ft stage with 64 newly acquired Vicon Peak MCam2 motion capture cameras allowed simultaneous full body and facial capture. As Rob Bredow, Digital Effects Supervisor at Sony Pictures Imageworks,

THE NEXT BIG THING | Digital cloning

THE BIG IDEA "There's no big idea. It's a simple idea – start from the real thing by scanning, motion capturing and photographing a real person. Then figure out how to manipulate the data to give you what you want," says Electronic Arts' George Borshukov. "Digital face cloning offers a solution to facial animation in which the face of an actor is digitised using recording devices. The beauty of this is that there's no need for modelling any physical properties of the face. They're captured in the data."

WHO'S WORKING ON IT? Worldwide Studios, Electronic Arts

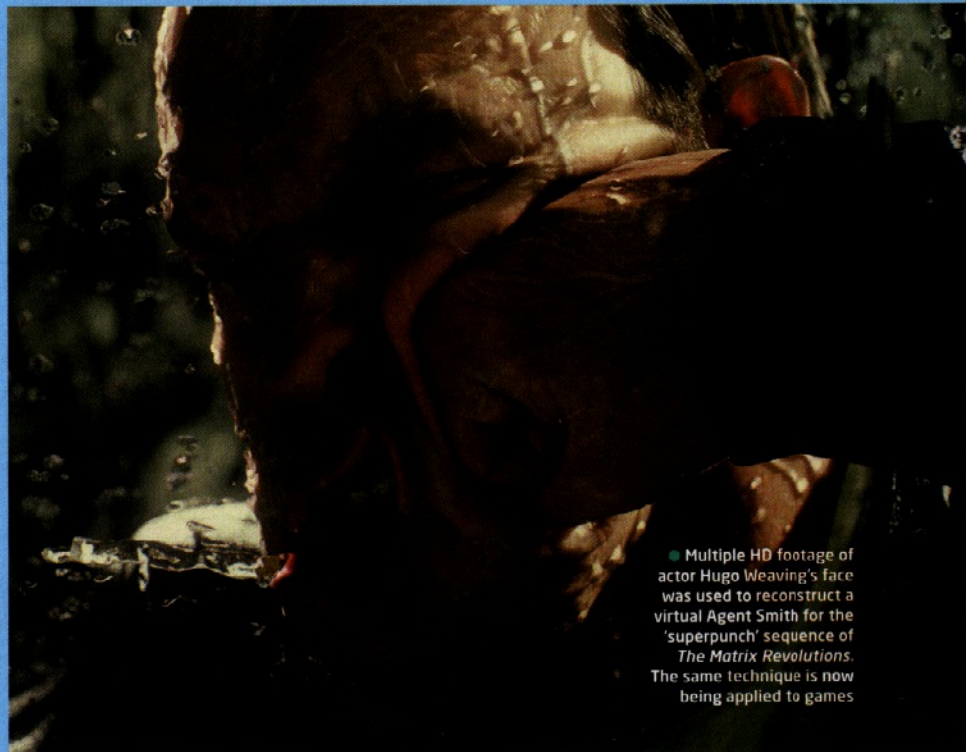
WHAT DOES IT INVOLVE? The actor, or his 'life cast', is cyber-scanned to acquire real pore and wrinkle detail. Skin reflectance is approximated or collected. Animation data is gathered via motion capture or video analysis, re-targeted and then used to drive the character model.

PROS A more realistic facial model, in terms of both appearance and animation.

CONS The data is hard to edit – what you capture is very much what you get. There's a limit to the amount of data that can be acquired through a capture process.

IN FIVE YEARS A standard process with a beginning-to-end off-the-shelf solution.

● Digital cloning, used in EA's *Fight Night Round 3* concept demo, means games characters with far more realistic skin, based on source measurements rather than painted maps



● Multiple HD footage of actor Hugo Weaving's face was used to reconstruct a virtual Agent Smith for the 'superpunch' sequence of *The Matrix Revolutions*. The same technique is now being applied to games

THE NEXT BIG THING | Next-gen crowd simulation

THE BIG IDEA An artificial life system that emulates processes used by nature to drive autonomous agents. When scaled up into the hundreds or thousands, the interaction within the crowd that emerges from these individuals is highly realistic.

WHO'S WORKING ON IT? Massive Software has developed a commercial range of products. Various visual effects and games studios, including Electronic Arts, the Moving Picture Company and Sony Pictures Imageworks, have developed proprietary systems.

WHAT DOES IT INVOLVE? A Technical Director designs characters with a set of reactions to what's going on around them. These reactions determine what these 'agents' do and how they do it, and can control keyframed or motion captured animation clips. By building variation into the characters, the artist can populate a scene with individuals who are unique in physical appearance and responses.

PROS Resulting simulations are far more convincing than traditional particle animation techniques.

CONS Render options are often limited to RIB export, and *RenderMan* or hardware-accelerated rendering.

IN ONE YEAR "Bringing the cameras forward," says Stephen Regelous, Founder of Massive Software. "Secondary characters created with *Massive* will hold up well, even on close-up shots. We'll see some very impressive results on the crowd scenes created by Sony Pictures Imageworks for *The Chronicles of Narnia: The Lion, the Witch and the Wardrobe*."

IN FIVE YEARS Hero performances from autonomous digital characters.

● *Massive* was used in 400 of the 2,000 visual effects shots in *Return of the King*. New developments in the software now enable it to be used when crowds are shown closer to the camera

explains: "We thought the small stage would only be used for a small percentage of the shots. We quickly realised that 80-90 per cent of the time, people wanted to work with full body and facial capture ... It was the first time motion capture had been performed on body and face simultaneously, and gave actors more leeway to ad lib their performances." Despite the vast amounts of data recorded, animation on every shot was still tweaked by hand, and lip movements (notoriously difficult to get through mocap alone) were always hand-animated. Much of the work on *The Polar Express* went into getting the eyes right. "Not

only are the eyes the window of the soul, but they're also where your eye goes to first," says Bredow.

ARTIFICIAL LIFE

Getting one virtual actor looking good is quite some achievement. Getting hundreds to look good is another matter. Historical methods for digital crowd control used particle effects, but modern techniques engineer crowds as groups of autonomous individuals, or agents. Stephen Regelous of Massive Software, creator of the celebrated *Massive* crowd-simulation system, says:

"NO ONE KNOWS WHAT'S WRONG WITH CURRENT VIRTUAL FACES. ASK, AND YOU'LL GET DIFFERENT ANSWERS, ALL OF THEM VAGUE"

JP LEWIS, CTO, GRAPHICS PRIMITIVE

"*Massive* emulates processes found in nature. By implementing machine vision and sound propagation, agents can see and hear each other. Agents react, as they would in life, in response to stimuli, so crowds appear highly convincing."

Other 3D studios have developed proprietary systems. To manage the vast crowds required in *Troy*, the Moving Picture Company developed *Alice* (Artificial Life Crowd Engine). Since then, it has been utilised in many films, including *Kingdom of Heaven*, *Alexander* and *Charlie and the Chocolate Factory*. According to MPC's development team: "Motion capture data is piped into our *Motion Library Editor* (MLE), a proprietary tool that finds relationships between clips. Technical directors specify what kind of clips they'll need for a given shot. *MLE* hunts through the available mocap clips to find those elements, then selects and combines them to create the best blend. *Alice* takes this data and enables the VFX artist to lay out crowd elements of the shot, as well as define other rules that will govern the crowd's behaviour."

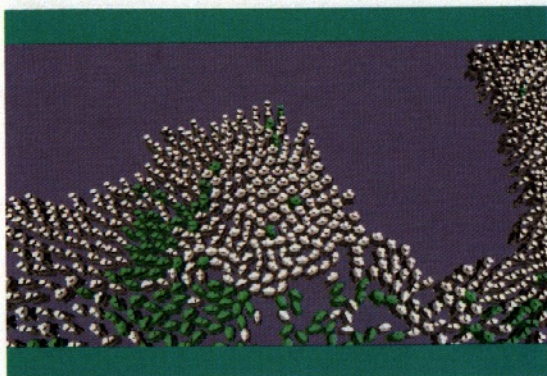
LEAVING THE UNCANNY VALLEY

In 1978, robotidist Dr Masahiro Mori plotted emotional response against similarity to human appearance and movement in a study designed to provide insight into psychological reaction to robot

● Proprietary alternatives to the well-known *Massive* crowd-simulation system include MPC's *Alice*, used in this shot from *Charlie and the Chocolate Factory*



● *Alice* enabled MPC to motion capture a single actor, Deep Roy, duplicate him over 50 times, then place the resulting doubles into the same shot



● Systems like *Alice* achieve realistic crowd motion by emulating natural life processes. This image shows data from a shot from *Kingdom of Heaven*

design. The results were startling. The closer that robots, or indeed synthetic humans, come to resembling ourselves, the more positive our emotional response towards them – up to a point. But as the similarity of a robot to a real human approaches 95 per cent, we suddenly start to describe its appearance as creepy – like a corpse brought to life. This sudden swing from positive to negative, referred to as the 'Uncanny Valley', is even greater as the motion of a synthetic character approaches, but doesn't quite reach, a 100 per cent resemblance to human motion. Most video games today don't engage players' empathy to their full potential because their levels of realism fall into this Uncanny Valley. George Borshukov, now at Electronic Arts, argues that through reconstructing virtual humans from real-life source data, we can climb out of the Uncanny Valley and set a new level of photorealism (see boxout: 'Digital cloning').

His latest work, with Electronic Arts' Worldwide Studios, extends the technology developed for the *Matrix* sequels through its application to game design. In its concept demo for *Fight Night Round 3*, a next-gen game for the Xbox 360 and PlayStation 3, real-life video and performance data is used to reconstruct two photoreal boxers as they fight head to head in the ring. What's truly outstanding is that these fighters are rendered in real-time. Electronic Arts is guarded about revealing its product roadmaps, but when pressed, Borshukov admits that, within the next two years, we could see this kind of technology applied to primary characters in next-gen games.

A NEW KIND OF TURING TEST?

Over the last five years, we've seen some amazing and beautiful images of digital humans, but the general consensus is that when it comes to lead characters who remain in shot for anything more than a split second, the technology has some way to go before it passes the Turing Test of the 3D world at large. Ed Hooks, author of *Acting for Animators*, notes: "We're creating the digital human for a very discriminating audience: other humans. We're all expert at recognising our own kind and do so in the blink of an eye."

Psychologists studying this phenomenon believe it's likely that human facial recognition is built into our genetics. Clinical psychologist Dr Claire Gould tells us: "Newborn children appear to be genetically predisposed to recognising the human face,

TALKING POINT | Where will we be in five years?

VIRTUAL EYES



George Borshukov
Computer Graphics Supervisor,
Worldwide Studios,
Electronic Arts

"I hope that we will have figured out how to 'learn' from captured data libraries, which would allow us to produce results with the same fidelity as the UCAP [Universal Capture] approach, but for situations not actually captured. The eye area will probably be tackled, as people now admit how important, yet extremely difficult, it is to get right."

VIRTUAL BRAINS



Stephen Regulous
Founder and Product Manager,
Massive Software

"We'll see an emphasis on hero performances of autonomous, digital characters, driven by artificial life systems. Agents [virtual characters within the system] will hold up in more demanding situations, and will be convincing even when closer to camera. Secondary characters will already be looking very good."

VIRTUAL SKIN



Rob Bredow
Digital Effects Supervisor,
Sony Pictures Imageworks

"We'll see more close-ups of convincing photoreal virtual humans. Shading on the skin, lighting and the motion of the eyes will all get much better and become a little easier. We'll be seeing some highly realistic digital characters, setting a new high bar [for photorealism] in the next five years. The more time a studio spends on a shot, the better it will look."

VIRTUAL MUSCLES



Ron Fedkiw
Assistant Professor,
Computer Science Department,
Stanford University

"One of my friends at a major studio recently said that he thought it may take 10 years to get this sort of technology [determining underlying muscle activation in the human face from mocap data] into films. My reply was that he would find himself nine years behind next year when we do. That is, I'm very optimistic."

particularly faces where expressions change, rather than faces where expressions remain constant."

Researcher JP Lewis, CTO of Graphics Primitive, studied people's impressions of synthetic humans. He showed 15 sets of CG and real faces, first for a quarter of a second, then for one second, and then five seconds. The subjects judged which faces were CG and which were real. Lewis reports: "People are quite accurate at a quarter second, [which] gives us a clue that something fairly basic is still wrong – a quarter second isn't

"THROUGH RECONSTRUCTING VIRTUAL HUMANS FROM REAL-LIFE SOURCE DATA, WE MAY BE ABLE TO CLIMB OUT OF THE 'UNCANNY VALLEY' AND SET A NEW STANDARD FOR PHOTOREALISM"

GEORGE BORSHUKOV, CG SUPERVISOR, ELECTRONIC ARTS

enough time to process details." The study also revealed that "no one knows what's wrong with the current faces. Ask three people and you'll get three different answers, all vague – like 'something is wrong with the eyes'. As long as we can't say what's wrong, this is going to be hard to fix. It may be that, once figured out, [the solution] is easy to implement and allows all subsequent virtual actors to be perceived as real. Somehow, I doubt this."

But do we want our virtual characters to look truly photoreal? Sometimes, certainly, but as an art form, Rob Bredow believes that the most interesting challenges lie in creating stylised realistic humans. This, certainly, is an skill that artists and technologists will soon master. In the meantime, the concept of Human 2.0 is mature, living and (almost) breathing. ●

● Further reading

Intelligent facial capture:
<http://graphics.stanford.edu/~fedkiw/> (see 'Automatic estimation of facial muscle...')
Digital cloning in films and games:
www.virtualcinematography.org
Next-gen crowd simulation:
www.massivesoftware.com



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TUTORIALS

TECHNIQUES / TIPS / TRADE SECRETS

3DS MAX

crowd control

Bring virtual fish to life by creating an underwater flocking simulation with 3ds Max 7's Crowd system, referencing the pre-built model and animation states on the CD

BY PETE DRAPER

Over the past few years, crowd simulations have become an increasingly common part of movie and TV effects. But how do you go about creating one without even a TV budget? For this tutorial, we're going to set up our own crowd simulation to animate a school of virtual mackerel.

For this, we could use a particle system to drive the motion of the fishes, but without some serious work, achieving smooth motion when there is so much particle-to-particle interaction could result in erratic movement, intersection problems, and crowd members turning unrealistically on a hairpin. Therefore, we're going to use 3ds Max's Crowd system, which comes with *Character Studio* (native in 3ds Max since version seven). Using the file provided on the CD, we'll set up the characteristics of the initial Delegate (the non-renderable helper object that drives a fish's movements) before duplicating it multiple times. Then we'll add characteristics to our other Delegates - what happens when a certain event occurs, or what their main goal is - before performing the initial test simulation and adding additional Delegates as necessary.

Next, we'll introduce the fish model, which has basic animation states that Crowd will reference depending on the individual Delegate's motion. This is set up in the Dynamic Motion Synthesis, which uses block controllers to point to the desired animation frame range of the animated source object for that specific behaviour. Finally, we'll configure the scene's lighting and environmental effects before adding a camera.

Depending on the number of Delegates you introduce, the simulation may take some time to complete, so if you decide to simulate the school with hundreds of fish, you may need to run it overnight (or while watching *The Godfather* trilogy). Be aware that for each simulation you perform, the results will take a little longer to calculate. So, if you're going to perform a heavy one, it's advisable to save the scene, restart 3ds Max and then run the simulation.

Pete Draper is the Visual Effects Director at Lightworx in Bristol. His own school was burned to the ground in the 1990s, but he has a watertight alibi
www.xenomorphix.co.uk

FACTFILE

FOR

3ds Max 7+

DIFFICULTY

Advanced

TIME TAKEN

3 hours+ (depending on simulation time)

ON THE CD

- Start and finish scenes
- Full-size screenshots
- Finished animation

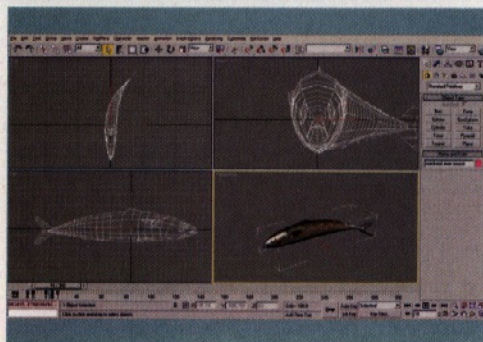
ALSO REQUIRED

N/A

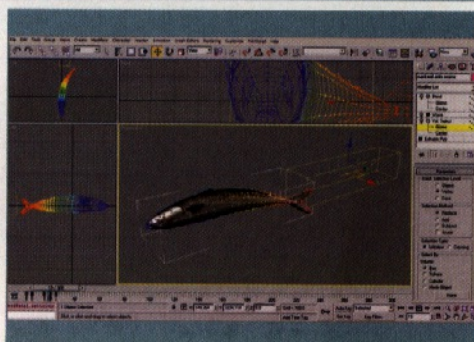




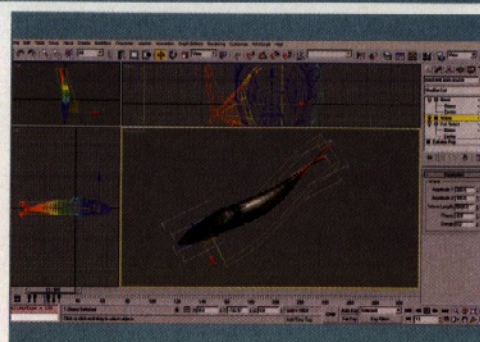
STAGE ONE | Initial scene analysis and setting up the target animation



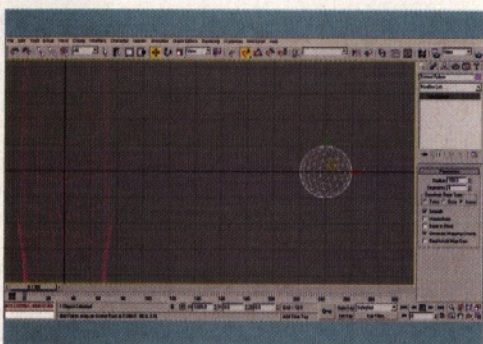
01 Open the 'fish_school_start.max' scene included on the CD (accept any unit change if prompted). Here we have a basic scene, with the fish that we're going to use with some initial animation states already applied. Select the 'mackerel anim source' object, grab hold of the Timebar and scrub it from side to side over the (preset) 300 frames.



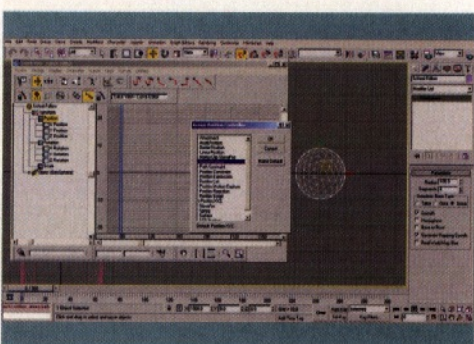
02 If you go across to the Modifier tab, you'll notice that the animation has been generated using several modifiers. Starting from the bottom (the basic fish model), we have a Volume Select modifier that drives a soft selection, so that the strength of any modifiers we apply later is reduced along the length of the model.



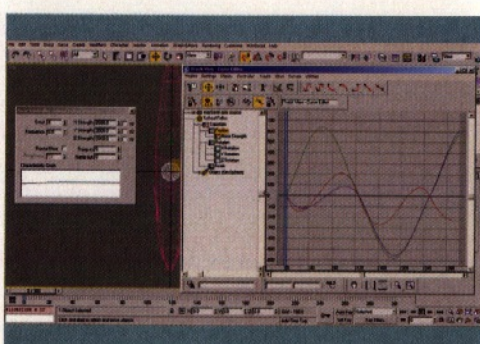
03 The first animation state set-up is the swimming motion after an initial cruise period (no animation assigned). This is important, as we'll assign this stationary period to the system's animation later. After an initial swim cycle generated by animating the Wave modifier's Phase, there are two additional turning cycles applied, which you can introduce to the system, if you want to, later on.



04 To get the school to travel around the scene, we're going to create an object that the fish will attempt to follow. This object's motion will be smooth yet random, so we'll generate this by using a Noise Position Controller and by setting its parameters accordingly. In the Top Viewport, create a Geosphere with a Radius of 100 and label it 'School Follow'.

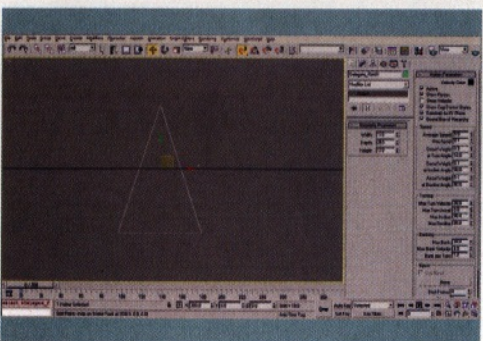


05 With the Geosphere object still selected, right-click in the Viewport and select Curve Editor in the quad menu. Next, we'll replace the existing position controller of this object with a random noise generator controller. In the Curve Editor, select the Position controller, right-click and select Assign Controller. Select Noise Position from the list and click OK.

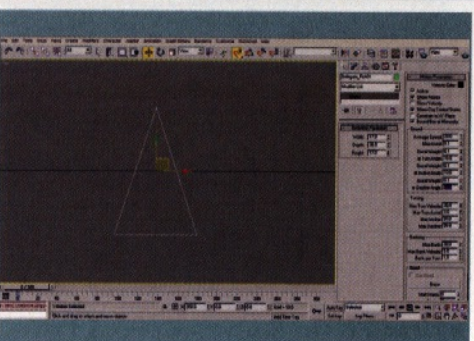


06 The Geosphere object's position is now driven by the Noise controller, so it's been immediately relocated. Scrub through the animation. The object's motion is erratic, therefore we need to smooth it out. Set the X, Y and Z Strength to 2000 for a larger range of motion, amend the Frequency to 0.01 to increase the wavelength and turn off Fractal Noise.

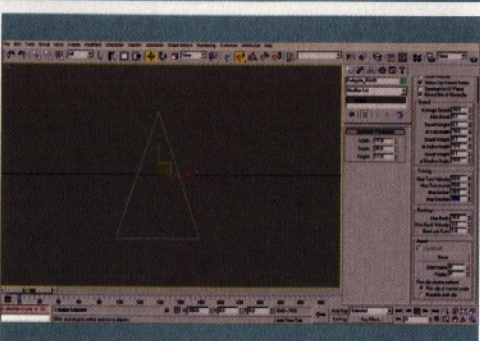
STAGE TWO | Creating the initial Delegate and setting parameters



07 The Crowd system calculates the simulation using non-renderable helper objects called Delegates. Our renderable objects (the fish) are linked to these objects later on. Let's set up our single initial Delegate and assign properties that will tell it how to move. In the Top Viewport, create a Delegate helper object with a Width of 17, Depth of 25 and Height of 17. Label it 'Delegate_Fish01'.



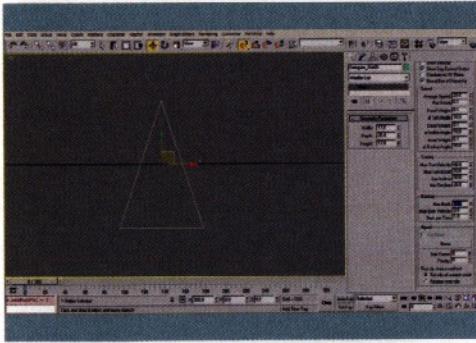
08 Turn off Constrain to XY Plane so it can move in all axes. In the Delegate's Motion Parameters rollout, set the Average Speed to 20 for a fast darting motion. Set the Decel Weight to 0.1 (turn angle) so it doesn't slow down as much when turning. Set the Incline and Decline Angle settings to 10, so that we have a slight deceleration when the Delegate is turning to travel up or down.



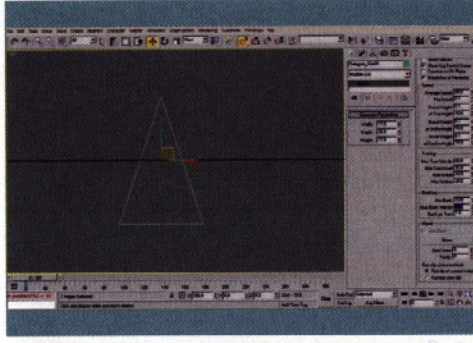
09 In the Turning group, set the Max Turn Velocity to 60, which is how many degrees the Delegate can turn in a single frame. As we're dealing with fish, which can turn quite sharply, this value is set high. Set the Max Turn Accel to 10 so we can have a sharp turning acceleration. Set the Max Incline and Max Decline to 30, as the Delegate can't turn vertically as easily as it can sideways.



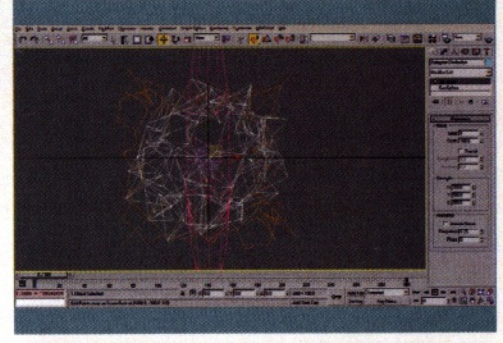
STAGE TWO (Continued) | Creating the initial Delegate and setting parameters



- 10** In the Banking group, set the Max Bank value to 10 so that the fish don't start tilting when turning. Looking at reference material online, you will notice that most fish tend to stay virtually vertical unless turning at exceptionally high speeds. Therefore, we want our fish to stay upright as much as possible, reducing this value so it's more subtle.

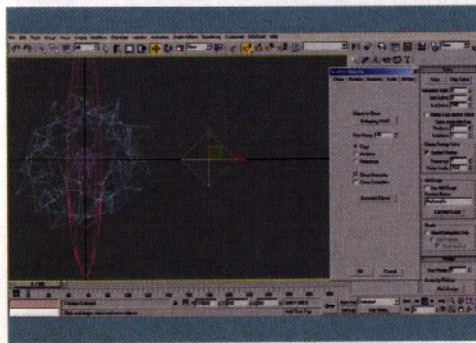


- 11** Amend the Max Bank Velocity setting to 10 which, as with the Max Turn Velocity, indicates how many degrees that the banking will change per frame. So, we get a banking change that is sudden when turning at high speeds, which fish like mackerel tend to do, to keep formation and avoid predators.

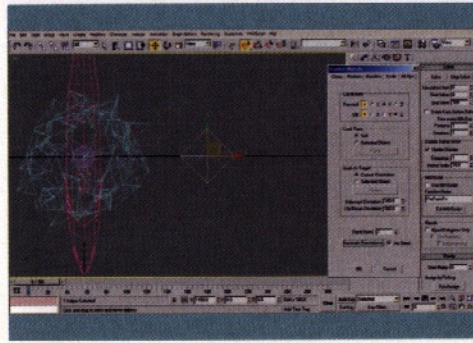


- 12** Now that we have the initial properties of our Delegates established, we'll distribute a small number of them in the scene to test the simulation, using an object as the distribution method. In the Top Viewport, create a Geosphere at 0,0,0 with a Radius of 500 and label it 'Delegate Distribution'. Add a Noise modifier and set its X, Y and Z Strength settings to 500.

STAGE THREE | Scattering Delegates and adding behaviours with Crowd



- 13** Before we start setting up the behavioural properties, we'll first scatter a small number of Delegates over the distribution object. In the Top Viewport, create a Crowd helper object. Click its Scatter button and, in the dialog box, add the 'Delegate_Fish01' object to its Object to Clone field. Set the number of objects to 49 and turn off Clone Controllers. Click Generate Clones.



- 14** In the Position tab in the panel, select On Surface and add the Delegate Distribution object to its Grid/Box/Sphere/Surface/Shape field. Ensuring no scattered objects intersect, enter a Spacing value of 1.5 and click on Generate Locations. In the Rotation tab, set the Sideways and Up/Down Deviation values to 180. Click on Generate Orientations and OK.

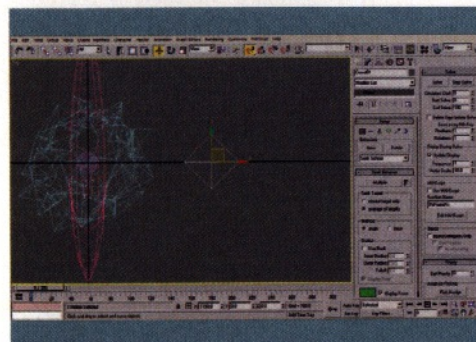
EXPERT TIP

Adding behaviour sets

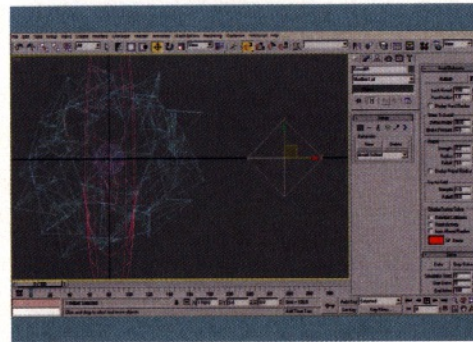
We need 3 main behavioural events:

- Seek Target** - to find the moving Geosphere we've set up using the Noise Controller
- Seek School** - to find the centre of mass of the school
- Avoid School** - to prevent Delegates hitting each other

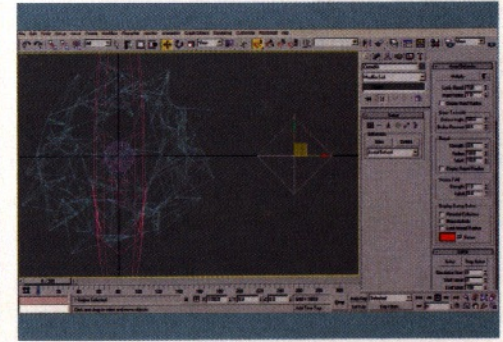
We'll introduce an additional behaviour driven by a Wind Space Warp, to submit the fish to a buffeting by the ocean swell. We're working with a reduced number of Delegates so that our simulation calculation times are reduced.



- 15** Click on the New button and select Seek Behavior. Edit the name to 'Seek Target'. In the new Seek Behavior rollout, click on the None button and select the School Follow object. Set the Method to Force, so the attraction to the target is constant. Add another Seek Behavior. Rename it 'Seek School', select the Multiple Selection button and select all of the 'Delegate_Fish' helpers.



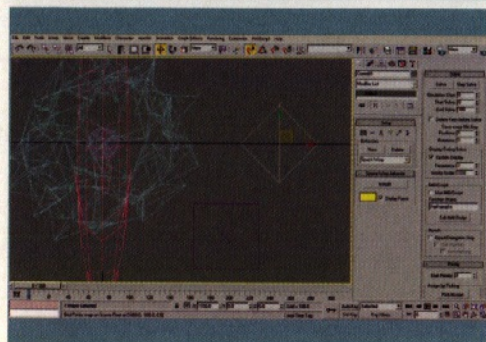
- 16** Add an Avoid Behavior and rename it 'Avoid School'. Click the Multiple Selection button and select all the 'Delegate_Fish' helper objects. Set the Look Ahead value to 150, so that the Delegates look further forward to try to avoid objects instead of having to stop and wait. Set the Detour Angle to 90 and the Brake Pressure to 0.5, so that the Delegates will be more likely to try to find another route.



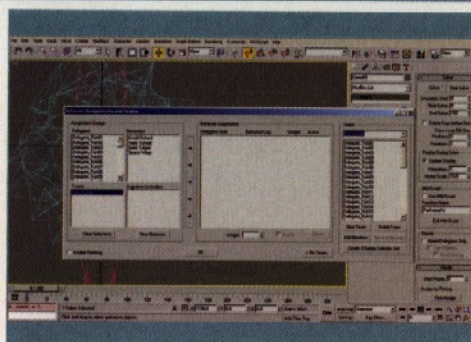
- 17** In the Repel Group, set the Strength to 0.5 to increase the repulsion force, which forces Delegates at close proximity to avoid one another. Set the Radius and Falloff to 10, so that even though we have a large radius, the repulsion strength is stronger nearer to the Delegate than at its outer boundary.



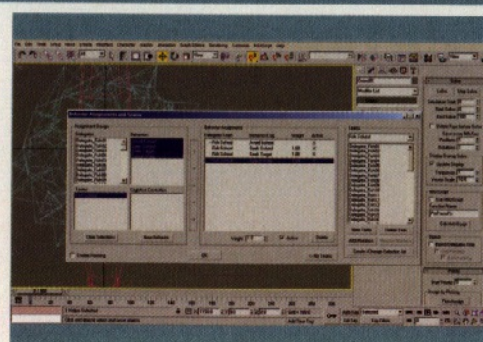
STAGE THREE (Continued) | Scattering Delegates and adding behaviours with Crowd



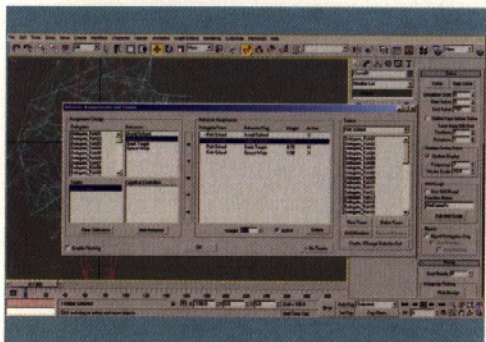
18 Add a Wind Space Warp to the scene in the Top Viewport. Set its Strength to 0 so that direction isn't affected, reduce Turbulence to 0.5 and set the Scale to 0.001 for a large turbulent waveform. Finally, add a Space Warp Behavior to the Crowd helper and add the Wind Space Warp to its Space Warp Behavior rollout.



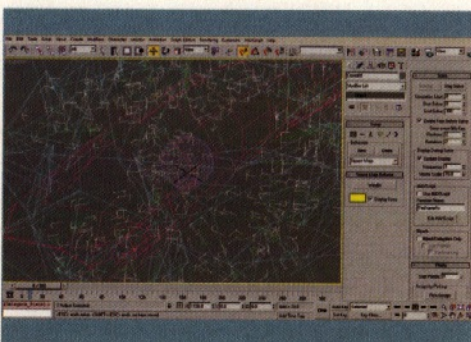
19 Now that we have our behaviours set up, we need to assign them to the Delegates and to weight them as necessary. Click on the Behavior Assignments button and, in the dialog box, create a New Team and add all Delegates to it. Label the team 'Fish School'. This makes managing multiple Delegates with the same properties easier, especially when assigning behaviours.



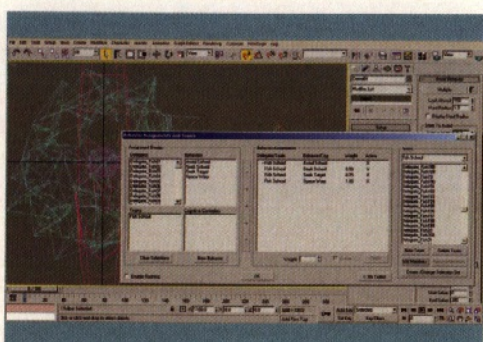
20 Once the team has been created, it's been added to the Teams list. Select the Fish School team and, in the Behaviors list, select all four behaviours and click on the New Assignment button to add them to the Behavior Assignments list for weighting. We want the Wind Space Warp to affect the Delegates overall, so leave the weighting at 1.



21 Next in order of preference is finding the target, so set the weighting for this at 0.75 and, finally, the Seek School weighting to 0.5. If the school was avoiding a predator, the fish would stick more closely together, with Seek School having a higher weighting. Click on OK to accept these values. Next, we need to run the simulation, but first we need to tweak a setting or two...

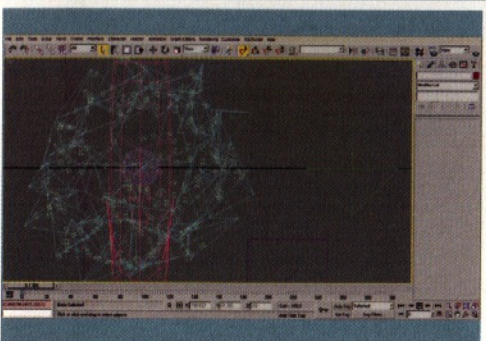


22 In the Solve rollout, amend the End Solve setting to the length of our scene's animation, which is 300 frames. If we're performing multiple test simulations, it's always wise to use Delete Keys before Solve, so enable this. As we won't need every single keyframe, amend the Positions and Rotation's Save Every Nth Key settings to 2, save the scene and then click Solve.

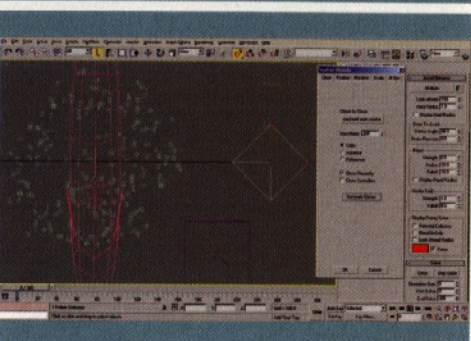


23 Now we can go back and add more Delegates, but it's advisable to remove all existing Delegates (apart from 'Delegate_Fish01') and clone another 199 as before - re-scatter, position, orientate, assign into behaviours and teams before assigning to behaviours. This may sound like wasted time, but, as with particles, it's always wise to test simulations with reduced numbers.

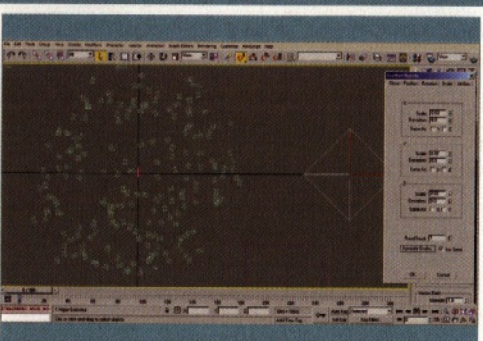
STAGE FOUR | Adding the Fish model



24 With the new Delegates created, and the simulation run, we can now assign the model to the full 200 Delegates. For this, we'll go back into Scatter to create the clones before orienting and linking them to the Delegates using Object/Delegate Associations. This binds the relevant model to its Delegate, so that animation properties can be derived from them later on.

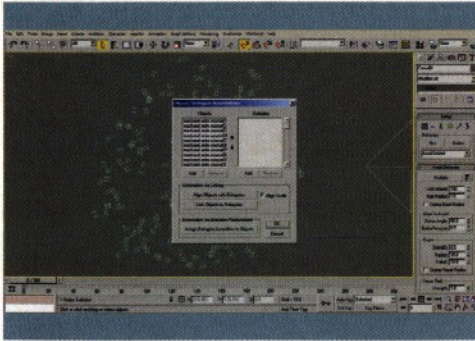


25 Hide the Delegate Distribution and School Follow objects, as we no longer need them. In Crowd, select Scatter and select the Object to Clone as the 'Mackerel Anim Source' object. Set the number of copies to 200, because we still need to use the original object. Click the Generate Clones button.

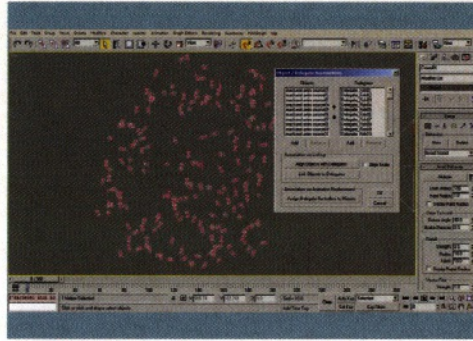


26 Because the fish are too big, we need to scale them down to about 2 per cent of their original size. Go to the Scale tab and enter the value of 0.02 in the X, Y and Z Scale fields, and click on Generate Scales. You'll notice that the original fish model has also been scaled down, which is normal. Click OK to exit this panel. Don't worry that the fish haven't been linked with the Delegates.

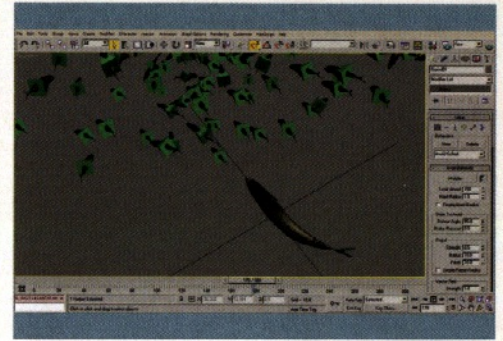
STAGE FOUR (Continued) | Adding the fish model



27 We now need to assign a mackerel object with its corresponding Delegate. Click on the Object/Delegate Associations button. In the panel, click on the Objects list Add button and add in objects 'Mackerel Anim Source01' to 200 - not the main 'Mackerel Anim Source' object, as we need this for animation reference later on.



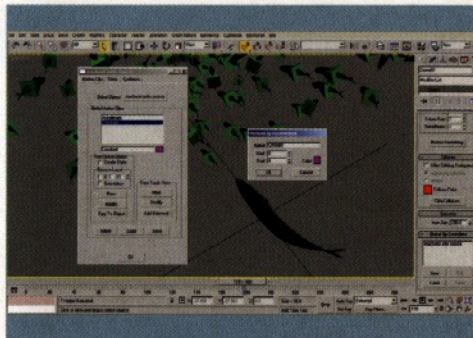
28 Add all of the Delegates to the Delegates list. Turn off Align Scale (we don't want the objects to inherit the Delegate's scale, which is at 100 per cent, or else we'll end up with lots of large fish). Click on Align Objects with Delegates to reposition them, and Link Objects to Delegates to bind the corresponding model to the Delegate, as illustrated in the Objects and Delegates list. Click OK.



29 Scrub through the animation to ensure that all 200 non-animated fish are linked to a Delegate and that the one remaining source fish is animated, yet unlinked, in the middle of the scene. With our fish bound to the Delegates, we need to reference parts of the source object's animation for each of the animated fish, so they behave accordingly when accelerating and cruising.



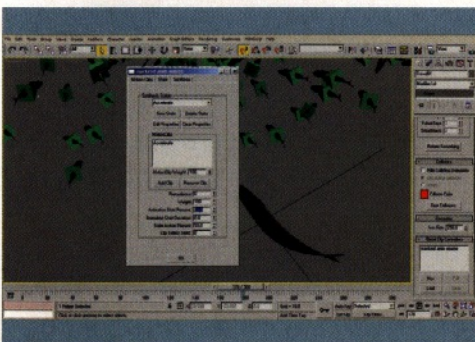
30 In Crowd, click on the New button in the Global Clip Controllers rollout. Select the 'Mackerel Anim Source' object and click OK to add it to the clip controllers list. Highlight this entry and click Edit to set up its parameters. Click on the New button in the Global Object group and rename it 'Accelerate'. Set the Start setting to 5, and End to 15 (the Swim section of the source object).



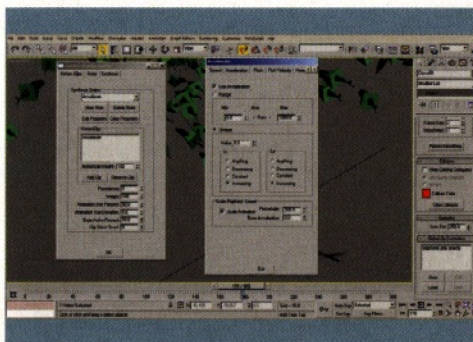
31 To simulate a constant speed, we'll add another animation state. Click on the New button as before and rename the entry as 'Constant'. Set the Start setting to 0 and End setting to 4, which is the non-animated section of the source animation sequence, so the fish simply glides through the water using its existing momentum.



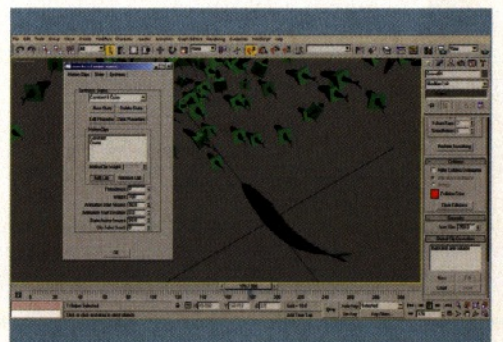
32 In addition to this, we'll add a random flick of the tail to keep momentum. Click on the New button again and label the new entry 'Cruise'. Set the Start setting to 5 and End to 15, as in the Accelerate motion clip. Next, we need to set up parameters that will call on these animation states when a certain motion event occurs.



33 Click on the State tab and click on the New State button. Rename the new Synthesis State to 'Accelerate' and click on the Add Clip button to select the Accelerate Motion Clip that it will reference. As we want the animation to blend to the central position of the swim cycle, we'll set the Animation Start Percent setting to 50 so that it's halfway through the cycle.

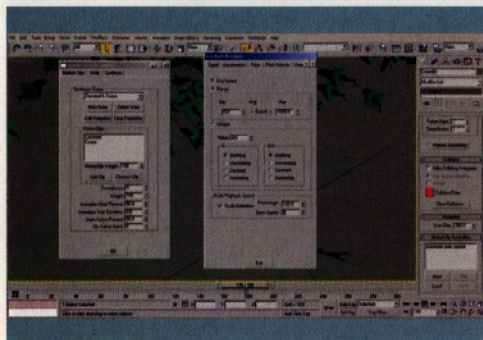


34 Click on the Edit State button to bring up an additional panel. Click on the Accelerate tab and enable Use Acceleration. Click on Unique and both Increasing icons to monitor for increasing values. Enable Scale Playback Speed and set Percentage to 300, which will play the source swim cycle 300 times faster to suggest rapid acceleration. Click the Exit button to close the panel.

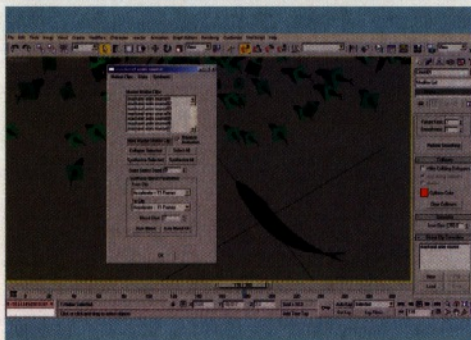


35 Now we need to set up Constant & Cruise, which will be called at random (due to equal weighting) via a single Synthesis State. Click on New State and edit the name to 'Constant & Cruise'. Set the Animation Start Percent to 50, as before. Click on Add Clip and select both Constant and Cruise clips. Click OK to accept the selection.

STAGE FOUR (Continued) | Adding the fish model



36 Click on the Edit Properties button and, in the resulting properties panel, enable Use Speed in the Speed tab. Enable Scale Playback Speed and set the Base Speed to 3, which tells the system that the original animation cycle should be played at the Delegate motion speed of 3, and should scale the animation cycle speed up and down accordingly. Click Exit.



37 The last stage of the crowd set-up is to tell the system which objects should be affected by the synthesis and how we blend the animation states together using the Master Motion Clips and Synthesis Blend Parameters. Click on the Synthesis tab and click on the New Master Motion Clip button, and add all 'Mackerel Anim Source' objects from 1 to 200 (this may take some time).



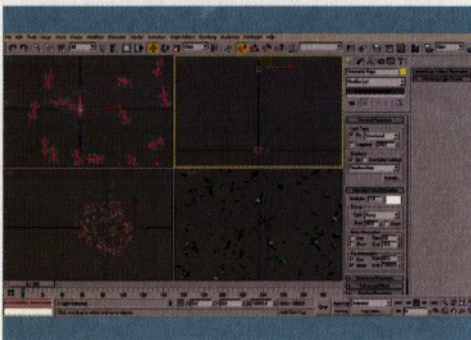
38 As we need the change in the animation state to be fast, we only need a short Blend setting from one clip to the next. Therefore, go through the 'From Clip' and 'To Clip' lists for every combination and set each Blend Start setting to 2. Finally, click on the Synthesize All button to apply the synthesis to all objects. Output a preview from the Perspective Viewport to see the result.

STAGE FIVE | Environment set-up: lighting and fogging

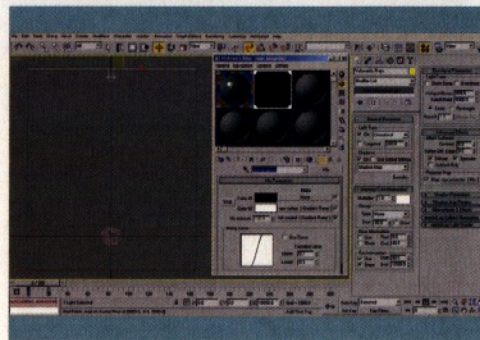
EXPERT TIP

Lighting the environment

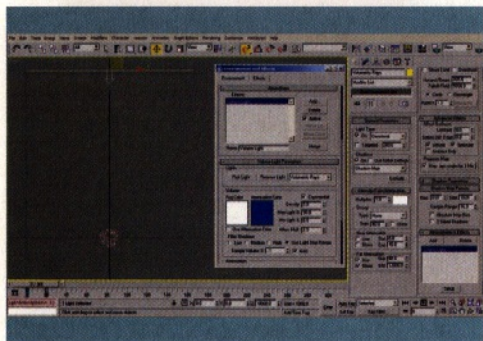
The lighting in the scene seems straightforward, yet there are several factors that need to be taken into consideration. First, the main key light (the sun) casts volumetric rays through the water. Second, the broken surface generates multiple specular highlights, so we have a large specular lighting array above the school. Finally, we have additional lights shaded and positioned to illustrate scattered ambient lighting. In the final scene on the CD, these lights don't have shadows enabled as default, but you can turn them on for a better effect.



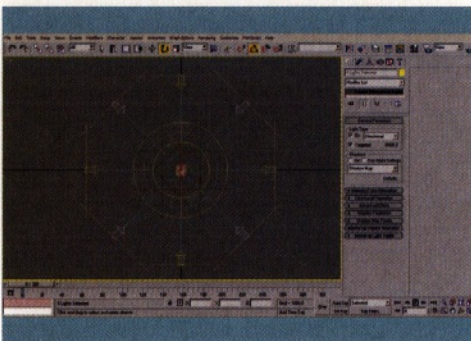
39 In the Top Viewport, create a Free Direct light at 0,0,0 and label it 'Volumetric Rays'. Move it vertically upwards 10,000 units in the Front Viewport. Enable Shadow Maps so that the fish cast shadow rays within the volumetrics. To control the volumetric ray falloff, enable Use Far Attenuation and set the End value to 12,000, so that we get a large falloff.



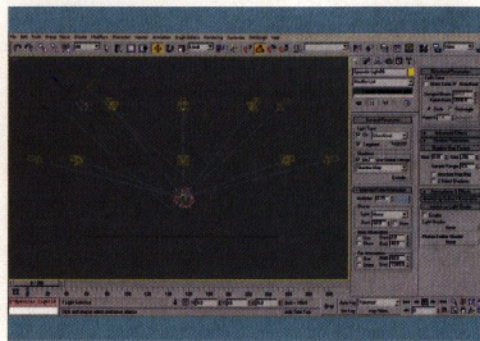
40 In the Directional Parameters rollout, set the Hotspot/Beam to 865 and the Falloff/Field to 5,000, so that the light fades out between these two values. Expand the Advanced Effects rollout and instance the 'Rays Projector' Mix Map from the Material Editor to its Projector slot. As we have a large area to cover, we need a relatively large Shadow Map size.



41 Expand the Shadow Map Params rollout and set the Bias to 0.01 to bring the shadows in tight to the objects that cast them. Set the Size to 1,024 and Sample Range to 16 to blur the shadow slightly. Expand the Atmospheres & Effects rollout and click on the Add button to add a Volume Light effect. Select this entry in the list and click on Setup. Enable Exponential.



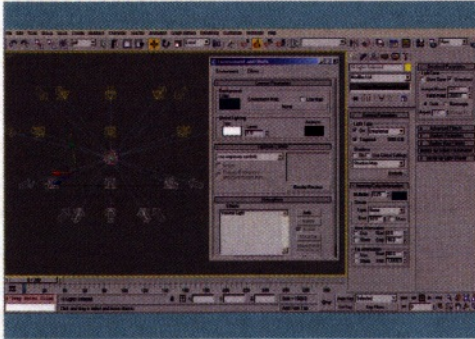
42 Next, we'll create a large Specular Lighting rig to simulate the broken light from the water's surface. Create a Target Direct light at 0,10000,0 in the Top Viewport and drag the light's target to the centre. Instance this light at 90 degrees (at 10000,0,0) and twice again to create four instanced lights. Select all four and instance-rotate them 45 degrees to create an array of eight lights.



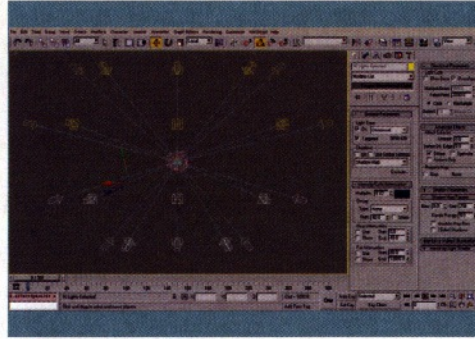
43 Select all eight lights and reposition them vertically in the Left Viewport. Instance the lights to create another ring and reposition as illustrated. Enable Shadow Maps, set the Multiplier to 0.25 and light colour to RGB 184,198,208. Enable Overshoot and set the Falloff/Field to 2,000. Set the Shadow Map Bias to 0.01, Size to 256 and Sample Range to 8 to blur the shadows.



STAGE FIVE (Continued) | Environment set-up: lighting and fogging



44 Now to simulate subtle ambient light emitting from the deep waters. Create a ring of instanced shadow casting lights as before, this time underneath the school, labelling the initial light 'Deep Water Illumination01'. Set the Multiplier to 0.25 and colour to RGB 58,77,89. Set the Falloff/Field to 2,000 and turn on Overshoot. Copy the light colour to the Environment Background colour as illustrated.

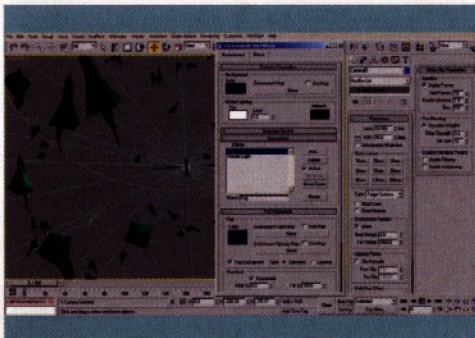


45 This time, turn off Specular in the light's Advanced Effects rollout, as we don't want additional specular highlights on the underside of the fish. We just want some additional tinted diffused lighting. Expand the Shadow Map Params rollout and then set the shadow map settings as in the other lighting array (if the settings are not already inserted).

EXPERT TIP

Volumetric lighting

To simulate the rays of light that are cast through the water in the final scene, we're using volumetric lighting. To simulate the moving surface, we have a nested map tree controlled by a Gradient Ramp map, so that we have more control over the light's falloff away from camera. Inside this map are additional maps that control the animation of the rays to simulate the animated surface. Be aware that volumetric lighting has an adverse effect on rendering times, especially if the quality is cranked up, so we advise using this sparingly!



46 Using the Perspective Viewport, position the viewing angle to get the best shots. Hit [Ctrl]+[c] to create a camera from this view. To simulate depth, add a Fog environment effect above the Volume Light effect, set its colour to that of the background colour and enable Exponential. Finally, enable Show Environment Ranges in the Camera and set the Far Range to 5,000 for fog depth control.



EXPERT TIP

Final scene cam animation

In the final scene, the camera has been animated in several ways to achieve realistic underwater motion. First, we need to create an effect to simulate the camera being buffeted around by ocean swell. You do this by linking both components of the camera to Dummy objects that are animated using subtle Noise Position Controllers. Next, the camera's target is hand-animated to follow the fish around the environment, while the camera itself is only affected by the animated Dummy object. Additional elements need to be introduced to give the impression of motion.

47 Our final simulation is fairly convincing. However, there are a few things that could be added to take it to the next level. As some of the fish turn quickly, we'll need to introduce the turning animations in the Source Animated Object into the synthesis.

Also, try going back to the Delegate simulation and add a few predators that prompt the 'herding' of the fish into a

tight ball, or get the school to follow a mass of smaller fish in a feeding frenzy! Finally, finish off the scene with some additional debris in the water so that we get a sense of travelling through the water when we animate the camera. If you feel that the animation takes much too long to render, try reducing the quality of the volumetric lighting, or by disabling shadows. ●

TRADE SECRETS

Perfect faces

Uncover the techniques used to create our cover image with these expert tips on facial modelling **BY OLIVIER PONSONNET**

One of the most fascinating things about 3D is that you can bring life to your creations without having divine powers. Obviously, in producing a credible, realistic character, the most difficult task is creating the face, and the reason for this is simple: it's the part of the body that allows us to communicate. We can sense one another's feelings at a glance. So any slight error on the part of the artist will instantly be picked up by the audience.

This sounds obvious when talking about photorealistic digital humans, but it's also useful when you want to create cartoons or caricatures. The fact that your character has a realistic mouth or eyes will help your audience believe in it.

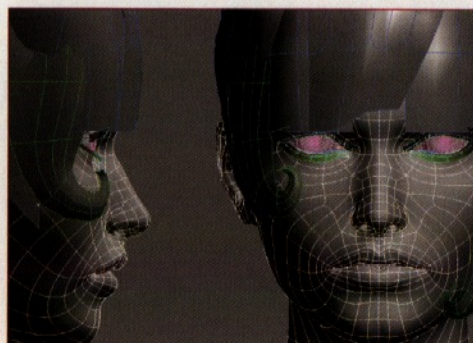
In this article, I'll be exploring some of the techniques used to create these kind of fine details in the image on the right, and explaining how to resolve tricky problem areas of the face.

The image took about a month to produce with *3ds Max*, from the first vertex to the final rendering. The rendering is almost pure, with only an additional slight colour correction filter – no details were added in postproduction. The mesh is built with polygons, including eyelashes and hair, beginning with a single polygon and then only extruding and cutting edges.

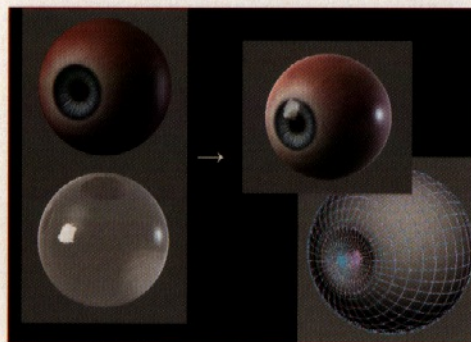
Tools are not so important during the modelling phase, but your mesh topology is. Topology is the way your polygons are arranged, and vital for the two most expressive areas: the mouth and eyes. You have to build your mesh topology around these two parts, because these are the most likely to be animated. If you don't have correct topology in these areas, your model will not deform properly.

The final aspect of a convincing digital character is the skin. While I don't have space to cover the process of setting up materials and textures for realistic skin here, you can find an article on the subject in issue 65 of *3D World*, or download it from the website.

Olivier Ponsonnet is a full-time student and part-time digital artist. He spends most of his time "creating digital beauties and little scared or scary children"
<http://re1v.free.fr>



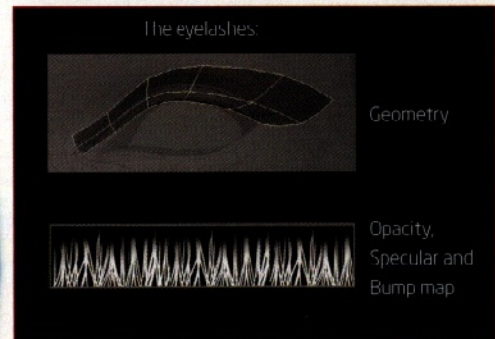
01 Always use reference files such as photos in your background viewport. Even you're not actually modelling the same face as shown in the photograph, it will help you achieve the correct proportions. Don't use photos taken with a short focal length (wide angle lens), or close to the subject. The reference photos must also have a perspective close to an orthographic view.



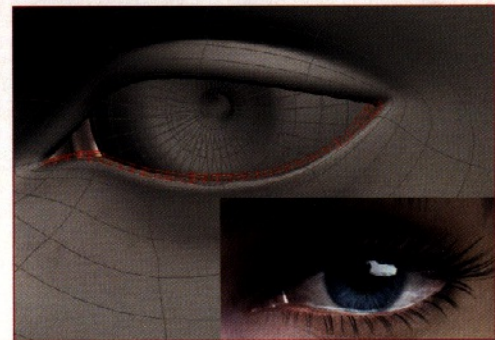
02 Eyes can be modelled in two parts: the ocular globe, and a second form with the shape of the central part (iris and pupil) modelled as a cavity. You can apply subsurface scattering to this part, because it's translucent. The inflated cornea and the liquid around the globe have the same material as the one applied to the tear lines (see Tip 4).



03 The model was created from a quad from which I then extruded and cut edges. A technique for getting good topology is to create the mouth first, then the eyes, and finally connect the two. Your polygons must form concentric rings around the open areas. Try to use four-sided polygons to avoid odd mesh smoothing results.



04 Hair, eyebrows and eyelashes are polymeshes. You only need one map to get them right: an Opacity map (the level of grey on the image determines the degree of opacity of your object). Use this same map as a Specular map so that your object only reflects light on the hair. And, finally, plug this map into the Bump map channel to get a slight volume effect.



05 A tear line (the line of fluid along the lower lid) adds realism to the eye. Here, it's a renderable spline placed where the eyelid and ocular globe meet. Its material is a fully transparent material with Fresnel-type reflections. If you're using *3ds Max*, you can also add a slight Noise map in the Bump map channel to achieve irregular reflections.



06 Most of the shaders here are reflective, so create something for them to reflect. Using an HDRI map as an environment map is a good solution. You can also use self-illuminated white boxes with classical lighting. Combined with global illumination, the boxes produce a diffuse light. This is the solution adopted in this instance.



FUTURE ISSUES

Issue 71

More advanced tools: radiosity and image-based lighting

Issue 72

Force CG lights to behave exactly like real lights

Issue 73

Successfully light an interior and an exterior scene

Subscribe today: page 44



LIGHTWAVE 3D

Get started in CG lighting Part 1

In this new series of beginners' tutorials, we'll be exploring the techniques required to create subtle, flexible lighting set-ups. We'll start with the simple scene above, adding complexity as we go

BY NICHOLAS BOUGHEN

FACTFILE

FOR

LightWave 3D

DIFFICULTY

Elementary

TIME TAKEN

30 minutes

ON THE CD

- Full-sized screenshots
- Base models (LWO format)
- Start and finish scenes

ALSO REQUIRED

A more detailed model (shown above) can be found in the Stop Press section of our website



Welcome to the world of computer-generated lighting. In this series we'll uncover the path to accurate CG light, focusing on LightWave 3D, although you'll find that the principles described apply equally well to any 3D application you prefer to use.

Here, in part one, we'll tackle the five lighting instruments available in *LightWave*. You'll learn the vast differences between these 'fake' CG lights and the behaviour of lights in the real world, gain the insight necessary to create better-looking renders, and finish up by generating a simple, four-point lighting set-up.

Subsequent instalments of the series will cover advanced lighting tools, some tricks to force CG lights to behave like real lights, and a practical example of how to analyse and set up an indoor and outdoor lighting environment. All supporting objects, images and scene files can be found on the CD.

Before we begin the tutorial, it's crucial to understand that all real lights and their shadows have the same basic properties – unlike the five different types of CG light and the wide array of properties you can select. In reality, lights have four characteristics. First, they

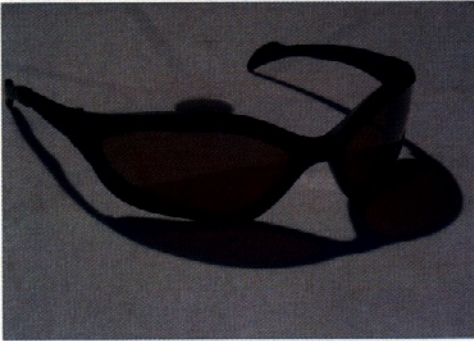
have physical dimensions and do not exist as a single point in space. Secondly, they radiate omnidirectional light from their entire luminous surface (the filament or fluorescent tube, for example). Thirdly, lights cause shadows that are sharp near the object casting them, but increasingly soft the further you travel from their source. (Go outside on a sunny day and have a look at a shadow cast by a lamppost – it will be very sharp near the post but soften along its length.) Finally, all lights cause shadows that will soften more gradually over distance if the light is very small, and more abruptly if the light source is large. A huge light source – such as the sky – will produce immediately soft shadows.

Armed with this know-how, it's time to delve into *LightWave* and start experimenting with natural CG lighting. We'll be starting slowly at first, then refining the test scene in future issues.

Nicholas Boughen is CG Supervisor at Rainmaker in Vancouver. His work includes *Dead Like Me* and *I, Robot*. He is the author of *LightWave 3D 8 Lighting*, and training videos for KURV studios. www.rainmaker.com



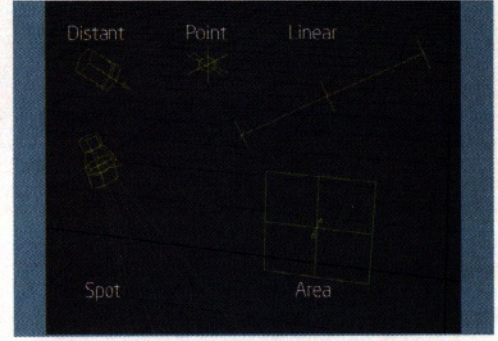
STAGE ONE | Understanding LightWave lights



01 This photograph demonstrates some basic light properties. The shadow edges lying furthest away from the sunglasses have softened slightly (not much, because the shadow lies just a couple of centimetres away). If you do the lamppost experiment mentioned in our introduction, you'll see an obvious softening several metres away at the top of the lamppost shadow.



02 Open *LightWave*. Light types and their respective shadow types, object exclusions and advanced parameters can be set in the Lights Properties panel. Open this by selecting any light and pressing the [P] key. Advanced parameters can be accessed by clicking the Global Illumination button on the main Lights Properties panel. Let's run through what each light type does.



03 The Distant light casts all parallel rays, partly like the sun. The Point light acts a little like a tiny LED while, as you would expect, *LightWave's* Spot light acts like a spotlight! It has a cone angle defining where the light shines. The Linear light performs somewhat like a fluorescent tube, and the Area light acts like a window, a computer monitor – or just about any light you may need.



04 The Distant light is meant to simulate sunlight. All light rays from this instrument are parallel, therefore shadows cast by objects are always exactly the same size as the object. Shadow edges are always hard. You can probably already see some major limitations of using this light as a 'real' light source.



05 The Point light emits omnidirectional light rays from a single non-dimensional point in space. Once again, shadows are always hard-edged. Like the distant light, this one also displays only one or two of the properties belonging to real light.



06 The Spot light is similar to the Point light, but the angle of its light cone can be adjusted, the cone edge can be made soft or hard, and it can use either raytraced shadows or shadow maps. The Spot light is the most commonly used light in *LightWave* scenes due to its flexibility and low render times. Shadow maps enable artists to 'fake' soft shadow edges.



07 As you've probably already discovered, the Linear light is a strange beast. It's meant to provide a cheap alternative to lights such as fluorescent tubes. It acts like a string of Point lights, which is actually how this sort of light was made in the old days. Notice that the shadows soften along the width of the glasses but not the length, making strange, rather unrealistic shadows.



08 The Area light is the most attractive and physically accurate light in the toolbox. This type creates natural-looking shadows that soften along two axes and become softer further away from the object, just as they would in the real world. The main drawback to area lights is they take a long time to render, but this is only a minor inconvenience if you're looking for stunning results.

EXPERT TIP

Working with shadows

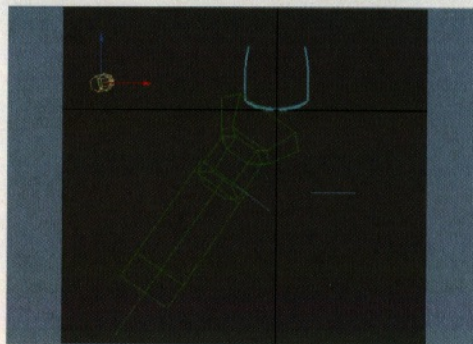
Raytraced shadows from Distant, Point or Spot lights are always hard-edged, because the rays either emit from a single point or are perfectly parallel (unlike illumination from real lights). Shadow maps enable us to use Shadow Fuzziness, which blurs the edge of shadows and adds realism. Be aware, though, that while real shadows change sharpness based on their distance from the object casting them, shadow map 'fuzziness' doesn't. It's exactly the same all over the shadow, so if your shadow is too fuzzy or soft, it will soon begin to look unrealistic.



STAGE TWO | Creating four-point lighting

EXPERT TIP

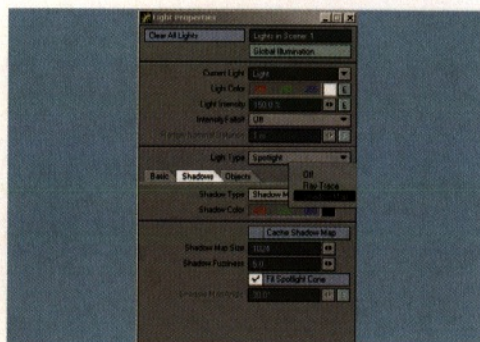
What is four-point lighting? Most CG artists are familiar with the term three-point lighting. This refers to a 'key', or main light source, a 'fill' source to fill in the shadows, and a 'rim' light to highlight the edges of the object in the shot. What is missing from this recipe is a 'bounce' light. In the real world, the key, fill and rim lights would reflect off the floor adding reflected illumination from below. However, since most renders are done without light bounces (radiosity) turned on, adding a fourth light from below will simulate this effect without the render times, increasing realism.



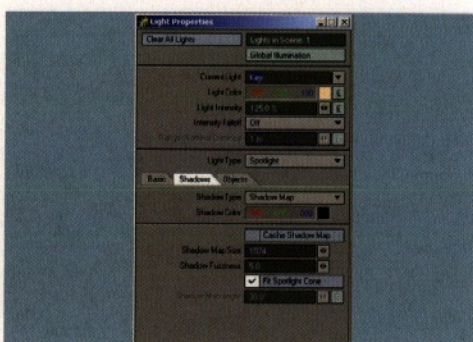
09 Open the scene called *3dw_LWLighting_part1.lws* from the CD. Notice that you're currently in the Top view, which is the best place to start aiming lights. There's one Distant light in this scene. Switch to Lights mode at the bottom-left corner of the interface, or use the [Shift]+[L] hotkey, then select the light. Hit the [P] key to open up the Light Properties panel.



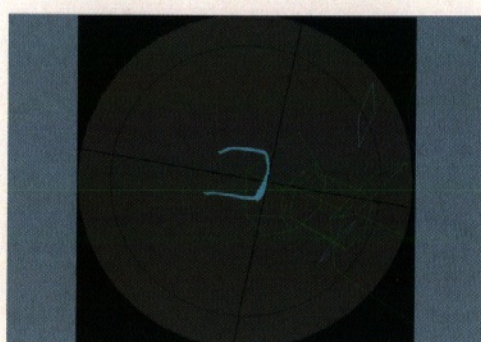
10 About halfway down the Light Properties panel, you'll see 'Light Type' with a drop-down beside it. Click on the drop-down and change the Light Type from Distant Light to Spot Light. This is where you would also change a light to one of the other types if required.



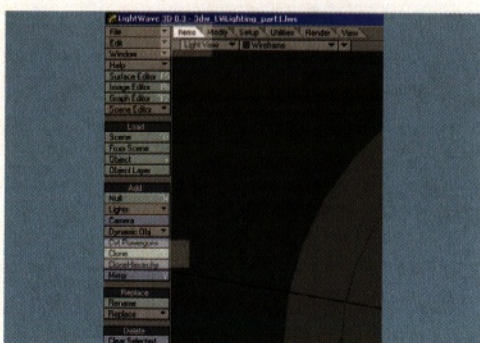
11 Just below Light Type, you'll find three tabs. Click the Shadows tab to access the shadow's parameters. Next to Shadow Type, there's another drop-down. Click this and switch the Shadow Type to Shadow Map. You could also select 'None' if you don't want your light to cast any shadows. Set the Shadow Map Size to 1,024 and the Shadow Fuzziness to 5. Leave all the other settings.



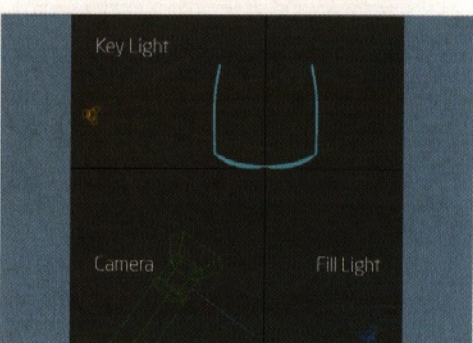
12 Near the top, beside Current Light, double-click the light name and edit it so it says 'Key'. Set the Light Intensity to 125 per cent by clicking inside the Light Intensity box and typing the new value. Change the RGB values by clicking on each of the RGB numbers one at a time and dragging to the left or right until the desired number is set. Use the values 255, 221, 190.



13 Now we'll position the light. Use the [5] hotkey to enter Light View mode. Hit [t] to enter Move mode and use the mouse to position the light while you're viewing it. The LMB covers the X and Z axes; the RMB covers the Y axis of movement. Try it out - it's a fun way to position a light. Make the view similar to the above image.



14 Check the upper-left corner of the *LightWave* interface to ensure you're currently in the Items tab. Along the left bar, find the Clone button or press [Ctrl]+[C] to clone the light. When the dialog box appears, simply click OK to make one clone. Now open the Light Properties panel, if it isn't already open, and rename the new light you've created (also called 'Key') to 'Fill'.



15 With the new Fill light selected, enter Top view (press [Z]) and position the Fill light on the side of the camera opposite the Key light. Now roughly position the light using the Top View and fine-tune the position using the Light view (press [5]).

EXPERT TIP

Lighting angles

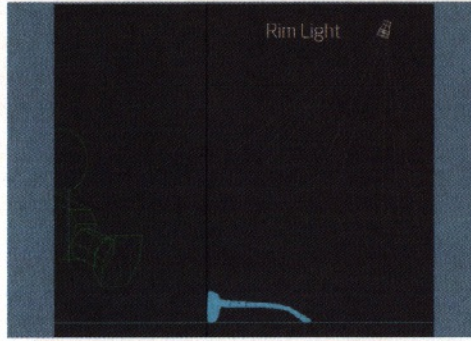
For a good three- or four-point lighting set-up, the Key and Fill lights should start on opposite sides of the camera axis, each at an angle of 45 degrees to that axis, and point downwards (in pitch) by 45 degrees. This will provide even coverage for the camera, plus good form, definition and colour mixing over the sides of the object facing the camera. Rim lights usually sit directly opposite the camera, and are more steeply angled to get a 'halo' of light around the object. The Bounce light sits at a point below from which its light is visible; the angle isn't crucial.



STAGE TWO (Continued) | Creating four-point lighting



16 Set the Light Intensity of the Fill light by clicking and holding the 'spinner' - the little box with arrows just to the right of the Light Intensity value. Set the Intensity to 60 per cent. Now adjust the Light Color box by clicking on the colour swatch to the right of the RGB values. Set the Hue, Sat and Lum boxes to values of 148, 240, 213. You'll notice that the Fill light is now light blue.

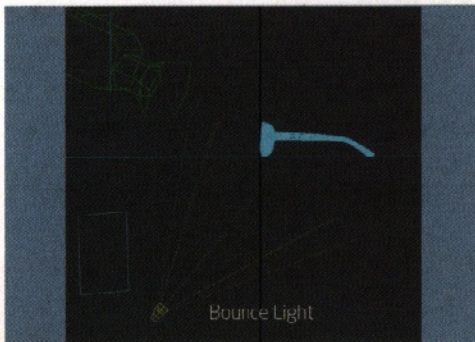


17 Clone the Fill light once, then rename it 'Rim'. Set the Intensity to 150 per cent and, this time, switch the colour to white, or RGB 255, 255, 255. Now position the light behind the sunglasses, directly opposite the camera and pointing down onto the sunglasses, as in the image above.

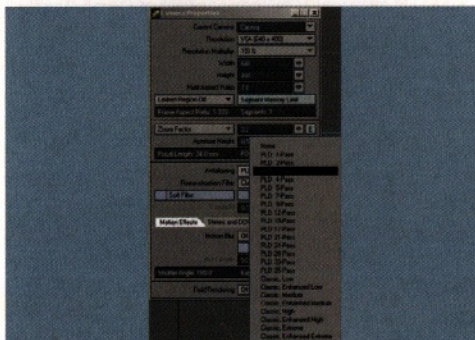
EXPERT TIP

Rim light intensity

The Rim light provides a highlight along the outline of the object in frame. Since there's already a Key light and a Fill light adding light intensity to the scene, you'll need your Rim intensity bright enough to cut through both. While lighting requirements and situations vary, it's useful to start by adding the intensity of the Key and Fill lights together. So, where the Key is 125 per cent and the Fill is about half of that at 60 per cent, the Rim will start at 185 per cent. Once you render, you'll know whether you need to modify this value.



18 Clone the Rim light and rename it 'Bounce'. Set Intensity to 25 per cent and the colour to 254, 227, 167. This is similar to the colour of stonewall.jpg, which has been applied to the ground texture. Position the light below the camera and aim it up at the glasses. Open the Objects tab on the Properties panel and exclude 3dw_ground. Switch to the Rim light and exclude the ground layer from it.



19 At the bottom of the interface, select Camera mode, or use [Shift]+[C] to select the camera. Press [p] to open the Camera Properties panel. Halfway down, find the Anti-aliasing drop-down. Click this and select 'PLD 3-Pass' so we have smooth anti-aliasing. Leave all other settings as they are and press [F9] for a preview render.



20 Analysing this render, I've decided to make some changes. I've moved the Key light further camera-left for better composition. Note that the amber Key light and the blue Fill light mix to near-white on most parts of the image, but where one or the other is occluded, the shadow colour is different. This is how real-world lighting works: notice on a sunny day how the lighting within

shadows is tinted blue by the skylight. Skylight falls everywhere, but you only really notice it in the shadows. Everywhere else, it mixes with the relatively amber sunlight to create near-white light. Also note that, in this scene, the fuzzy shadow maps are soft everywhere, unlike real shadows. The final settings can be found in the scene called 3dw_LWLighting_part1_finished.lws on the CD. ●

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...or one of two other superb intelligent interface devices from 3Dconnexion

Building on the two-handed power of the highly successful SpaceBall and SpaceMouse, SpacePilot is a unique and intelligent interface device offering great functionality.

Used in conjunction with a mouse, but offering faster, more intuitive control of 3D software than a mouse alone, the unit consists of a floating puck on top of a slimline base. At the rear of the base, there is an LCD screen, and surrounding the puck there are a host of control buttons. The circular puck moves in the X, Y and Z axes, and can be rotated in all three axes as well. This provides six degrees of movement, enabling any object to be positioned quickly and precisely. Its sensitivity can be adjusted, enabling you to master the device at your own pace.

Software supported by the SpacePilot includes *Maya*, *3ds Max*, *Softimage|XSI*, *Cinema 4D*, plus a wide range of industrial modelling packages. The drivers automatically configure, so that when you launch or switch to an application, the unit automatically reprograms. There are six pre-programmed function buttons, and a configuration button that can be used to access additional sets of button options. You can also assign as many banks of controls to these buttons as you like, defining any macro you require.

The SpacePilot can provide up to a 30 per cent increase in productivity and can reduce ergonomic strain by up to 50 per cent. It's supplied with drivers for a vast number of programs, and has a great training guide to help you get started.

To be in with a chance of winning a SpacePilot (first prize), a SpaceBall (second prize) or a SpaceTraveler (third prize), answer the following two questions and complete the tie-breaker, then email your entry to the address opposite.



QUESTIONS

Which axes can the SpacePilot move through?

- a) X and Y
- b) X, Y and Z
- c) Y and Z

By how much could the SpacePilot increase productivity?

- a) 10 per cent
- b) 30 per cent
- c) 50 per cent

TIE-BREAKER

"If I won 3Dconnexion's SpacePilot and had 30 per cent more time for fun, I would spend it doing ..."

Email your entry to ukcompetition@3dconnexion.com with the following subject line: '3D World competition'. Include your full name, address and telephone number. Entries will be judged on 6 December 2005, and three winners will be notified directly.

Meanwhile, for the chance to test-drive the SpacePilot free of charge for 14 days, visit www.3dconnexion.com/tryandbuy or call +44 (0) 1451 824344.

TERMS AND CONDITIONS

These rules include any instructions set out in the terms of this competition. By entering this promotion, the entrant will be deemed to have read and understood these rules and instructions and to be bound by them. Employees of 3Dconnexion, Logitech, Future Publishing Limited, or any other person directly connected with the offer or their immediate family will be ineligible to enter. Persons under the age of 18 may only enter with the consent of a parent or legal guardian. Any entry that is incomplete, illegible, late or otherwise does not comply with the rules may be deemed invalid by the sole discretion of the Editor. Proof of sending an entry will not be deemed to be proof of delivery. The winners will be notified as soon as they have been ascertained, and the results published on the 3D World website. The Editor's decision on all matters affecting this offer is final and legally binding. No correspondence will be entered into. The closing date for this competition is 5 December 2005.

CONTEST
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www.3dconnexion.com



First: SpacePilot
(£320 / \$575 / €465)



Second: SpaceBall
(£290 / \$525 / €420)



Third: SpaceTraveler
(£290 / \$525 / €420)

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Q&A

SOLUTIONS / FIXES / ADVICE

QUESTION OF THE MONTH

Submitted by Emil Nilsson,
via the forums

Q&A TIP

● Always do some hunting on the Internet for a MEL script before you try to write one yourself, as unnecessary scripting can compromise production time

MAYA

"How can I recreate the light trails in the new Dyson ad?"

FACTFILE

FOR

Maya

DIFFICULTY

Advanced

TIME TAKEN

Two hours

ON THE CD

- Full-size screenshots
- Start and finish scene files
- MEL scripts for steps 4-15
- Finished MEL script

ALSO REQUIRED

Mel Studio LE
(free from www.digimotion.com)
is useful but not compulsory

This issue's answer is supplied by Gary Noden, Head of 3D at 422 Manchester. If you inspect this magazine thoroughly, you may notice that he's quietly attempting to take it over

Those clever boys and girls at The Mill did it again with the Dyson 'Motion' commercial, which shows the company's latest vacuum cleaner travelling through space, leaving a skein of twisting light trails behind it. Lovely stuff, that's for sure. So lovely, it was covered in a big article in issue G5. (In case you missed it, a PDF can be found on the CD.)

But, using Dyson's vision as inspiration, how do we even begin to create something just as beautifully wispy and ethereal in Maya, especially when The Mill used a combination of *Softimage|XSI* and its own proprietary code? This is the question posed by reader Emil Nilsson, and the one on which this Q&A will attempt to shed some light. The obvious solution would be to use particles emitted from well-positioned locators using a high oversampling rate to keep fluid-looking lines, then disturb the results with turbulence. It's a nice technique, but very production-heavy. We want a 'lite' version that will render more quickly, so a poly or NURBS object that can be rendered using Maya or mental ray would be ideal.

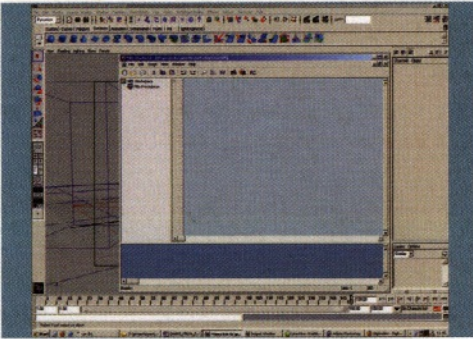
The simplest solution would be to create a partial extrude down a path curve that follows the motion of our source object frame for frame. We could then give it a glamorous shader, such as a Lambert, mapping its incandescence with a couple of ramps, then perhaps deform it with a displacement. It's a simple plan, but it might just work. But did we just say that we need to create a curve that follows the motion of the object frame for frame? That could take a very long time indeed – and we're going to need more than one trail, too, otherwise the finished effect will look underwhelming.

CURVACEOUS CODE

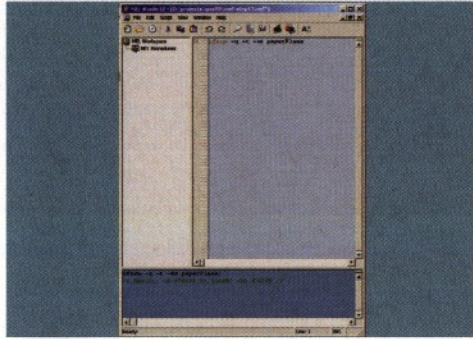
This is the point at which some people will assume that their dreams of colourful contrails are over, but fear not – we can write a handy little piece of code that will build our curves, as well as a small expression to animate the partial extrude. By parenting locators to the exact positions where we want our trails to grow, we can use a simple yet powerful MEL command called 'xform' to find their world position per frame. We can then translate the data into a linear curve that adds points to itself for each frame of our timeline, making a path curve. It may sound difficult, but it's not. As Douglas Adams once said, don't panic. Just don't expect pretty pictures on each step.



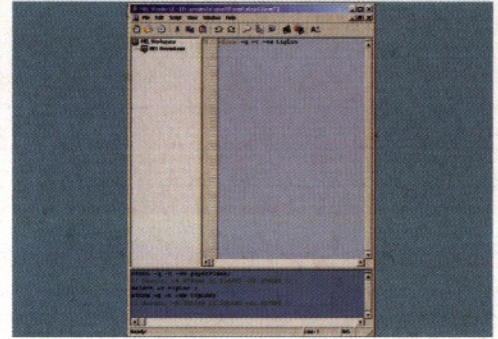
STAGE ONE | Setting up for scripting



01 If you haven't got it, go to www.digimation.com and download *Mel Studio LE*. It's a free IDE scripting tool that has more functionality than the Script Editor. Install it, load it via the Plug-In Manager, start a new project and then open the file 'shot1.mb' from the CD. It's the flight of a paper aeroplane bumping into a couple of pillars, and it gives us some interesting moves to create curves from.



02 If you look at the paperPlane node in the Outliner, you'll see four locators parented to it. Select the paperPlane and, in the Script Editor, type the following: `xform -q -t -ws paperPlane`, then press [Enter]. In the bottom of your Script Editor, you should see: `// Result: 0.676806 0.0136475 1.030718 //`. This corresponds to the translate nodes on the plane.

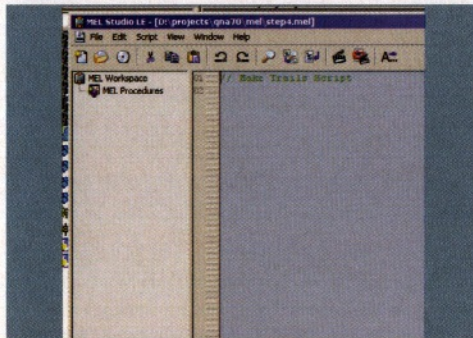


03 Now select the tip locator, 'tipLoc'. In the Channel box, you can see that its relative parented position is 0,0,1.013. This never changes through the animation, as it's only moved by its parent. In the Script Editor, type: `xform -q -t -ws tipLoc`. The result is: `// Result: 1.096589 2.90932e-005 1.952664 //`. We can do lots of nice things with this information.

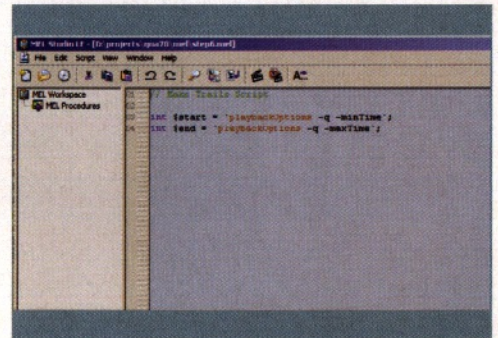
STAGE TWO | Building the curve script



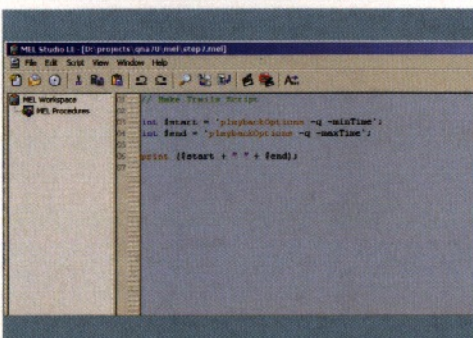
04 The 'xform' command is powerful. The command flags here are -q (query), -t (translate) and -ws (worldSpace), which return a result of the object's X, Y and Z position in the scene world, regardless of what it's attached to. If you want to find out more about it, simply type 'help xform' in *Mel Studio LE* and press the numberpad's [Enter] key (or see the documentation).



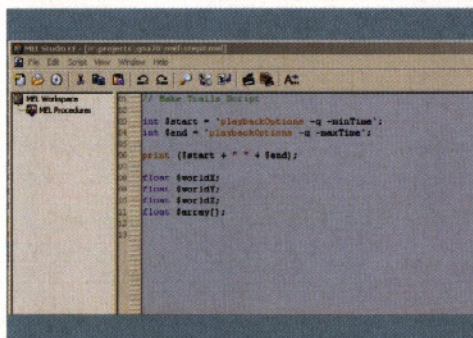
05 Open up *Mel Studio LE* by typing 'melStudioLE' into the command line and hitting [Enter]. Create a new MEL script file. We'll add lines of code to this to build our curve script. For now, type: `// Make Trails Script` (on the first line). Two forward slashes stop anything that's written after then from being regarded as a command, so these are used to annotate our script as we go.



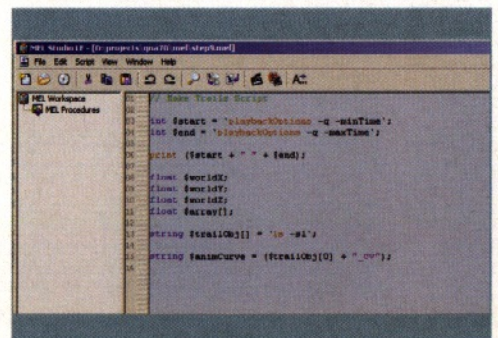
06 We need the time range to create our curves, so add: `int $start = 'playbackOptions -q -minTime';` (on the next line). This creates an Integer variable called \$start that gets its value from querying the start time. Don't forget the semicolon, as this terminates a line of code. On the next line, type: `int $end = 'playbackOptions -q -maxTime';` which finds us the End Time.



07 On the next line, add the following: `print ($start + " " + $end);`. Now highlight the three lines and select 'Execute'. In the panel at the bottom of *Mel Studio LE*, you'll see 1 150. Congratulations - you've just written a MEL script that prints two numbers! With these, we can make a loop that will run the 'xform' command on every frame. However, before we do this, save your script.

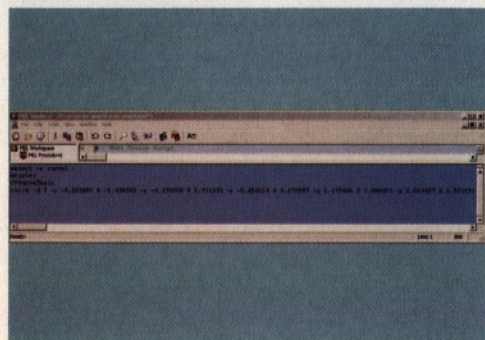


08 The \$start and \$end variables are integers, but now we need different types of numbers. Type: `float $worldX; float $worldY; float $worldZ; float $array[];`. A floating point variable is one that can have a decimal point. We'll use these for our world positions. \$array[] is a floating point array and can hold multiple items indexed from 0 to infinity. Save the script into your project's MEL directory.

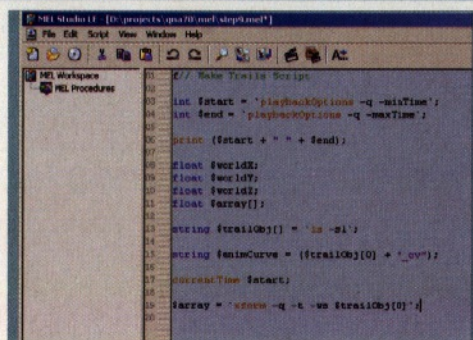


09 On the next line, type: `string $trailObj[] = 'ls -sl';`. Here, the list selected command is used to give us a name (\$trailObj[]) that we can use in the script. Beneath this, type: `string $animCurve = ($trailObj[0] + "_cv");`. This creates a name for the curve using the name of our object, appending it with _cv, which keeps everything nice and tidy. Save your script again.

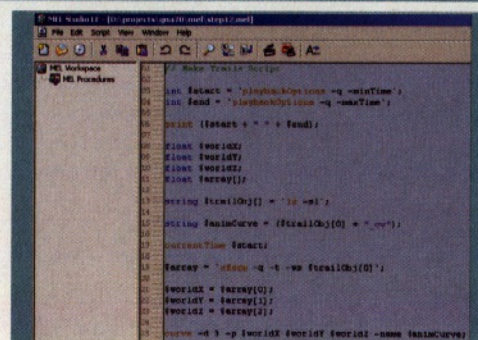
STAGE TWO (Continued) | Building the curve script



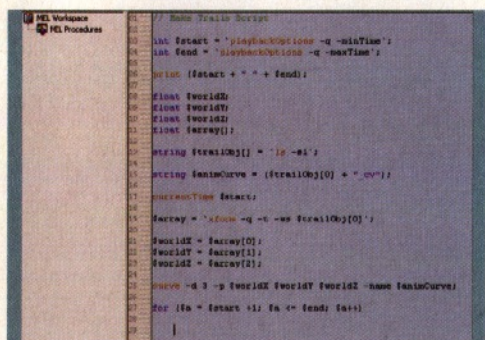
10 Now we have almost everything we need to get going. But first, open a new scene (you won't lose your Mel Studio LE window) and quickly create a curve in the view port. Look at the bottom of the window - that line of gobbledygook is the command for making a curve. We're going to make a single point curve using the curve command and add points to it.



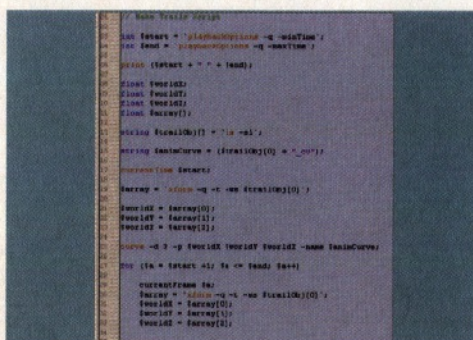
11 On a new line, type the following: `currentTime $start`; This will set the current frame to our timeline start. On the next line, type: `$array = `xform -q -t -ws $trailObj[0]``; This will store the X, Y and Z coordinates for our selected object into \$array. We can use these values by calling the array elements (`$array[0]` = the x translation, `$array[1]` = the y translation, and so on).



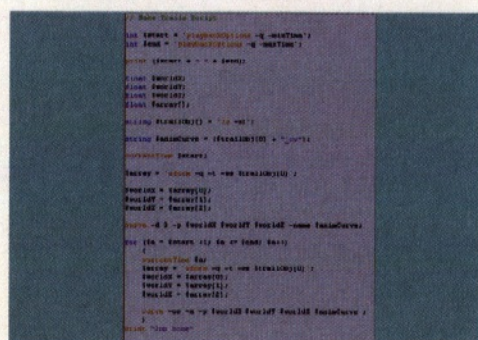
12 On three new lines, type: `$worldX = $array[0]`; `$worldY = $array[1]`; `$worldZ = $array[2]`; This sets the array values as the floating point values we need to make our curve. On a new line, type: `curve -d 3 -p $worldX $worldY $worldZ -name $animCurve`; Save the script. Select 'tipLoc' on the paperPlane and execute the script. If this worked, you've now got a curve made of one point called 'tipLoc_cv'.



13 To add points to the curve, we need to call the same translation values for each frame. We can do this with a loop command that uses the start and end times to move our script along the timeline. So, start the process by typing the following on a new line: `for ($a = $start + 1; $a <= $end; $a++)`. Note that there's no semicolon here, because we're starting a loop and not ending it.

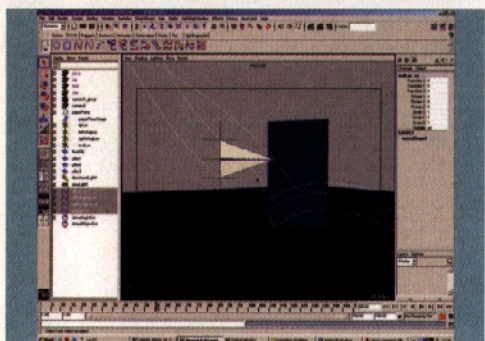


14 On the next line, type: `{` (This is an indicator that there are going to be multiple lines in the loop command. On the next line, type: `currentTime $a`; This shifts the frame to \$start + 1 (frame 2). Now type: `$array = `xform -q -t -ws $trailObj[0]``; `$worldX = $array[0]`; `$worldY = $array[1]`; `$worldZ = $array[2]`; (as you did before, or copy and paste them from higher up the script).



15 Next, type: `curve -os -a -p $worldX $worldY $worldZ $animCurve`; Using the curve command again, this finds the curve we made - \$animCurve - in objectSpace (-os), and then appends (-a) the point (-p) we 'xformed' at frame 2. On the next line, type: `}`; This closes our loop. Beneath this, type: `print "Job Done"`. That's it - now save your script again.

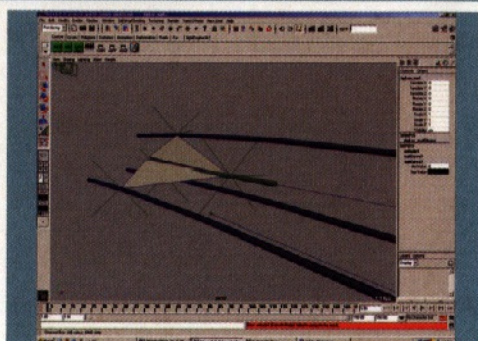
STAGE THREE | Looping the loop



16 This is the fun bit. Open 'shot1.mb' and change your viewpane to camera1. Select one of the locators on the paperPlane and then run your script (press the clapperboard on the Mel Studio LE toolshef). If you can see your viewpane properly, you've just witnessed a curve build itself over your frame range. Select each locator in turn and run the script. Now save your scene as 'shot02.mb'.



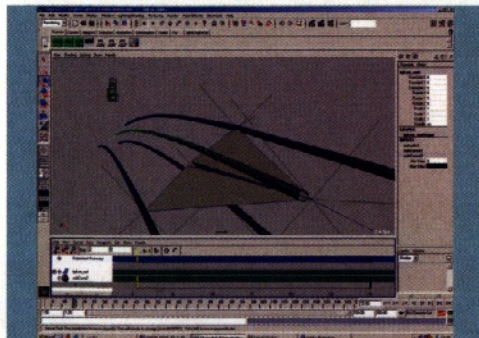
17 Scripting over - time to build our trails. Create a nurbsCircle and scale it down to about 0.05 in each axis, then [Shift]-select on 'tipLoc_cv'. Now select Surfaces > Extrude > Option Box. In the Extrude window, click on Tube, At Path, Component and Profile Normal, then in the Curve Range, click Partial. Now choose Apply. Repeat the process using the circle and each path in turn.



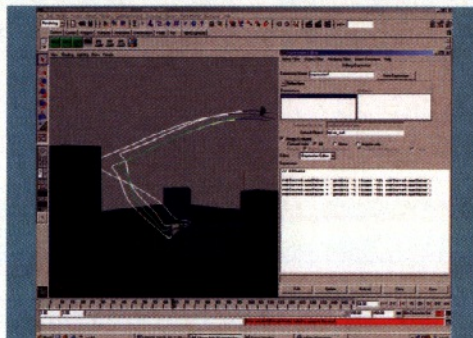
18 Rename your extrudes in relation to your curves ('tipLoc_cv' has a 'tipLoc_surf'). Select 'tipLoc_surf' and, in the Channel box, you'll see 'subCurve1' and 'subCurve2' under INPUTS. These control the growth of the extrude. Go to frame 1 and, in 'subCurve2.maxValue', keyframe a value of 0. At 150, set a keyframe of 1. Play your animation. Your tube grows - but out of the plane's nose!



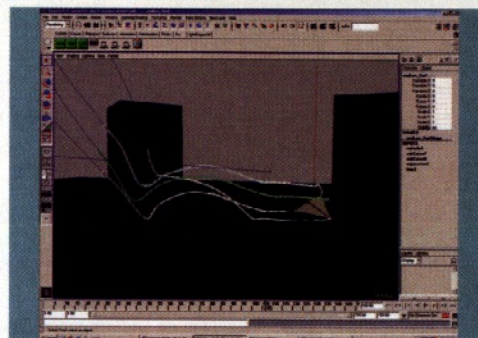
STAGE FOUR | Finishing the effect



19 To fix this, with your surface selected, open the Dopesheet Editor and move the keyframe at frame 1 to frame 2. Apply step 18 to the other surfaces, not forgetting the offset of one frame. Now we need a quick expression to offset the animation of the 'subCurve.minValue', so that the trails appear to die out. For this, we'll use the 'maxValue', but delay it by 50 frames.



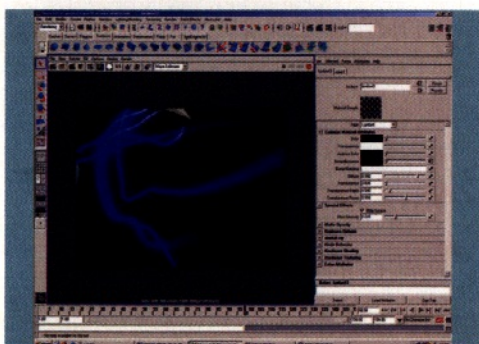
20 Open the Expression Editor and type '// Offsets', then click Apply. Just as in a script, we can use annotation in expressions - It's MEL, after all. Now type: `subCurve2.minValue = `getAttr -t (frame -50) subCurve2.maxValue`;` 'getAttr' means get the Attribute value, and '-t' refers to time - in this case, -50 frames. Repeat and edit for subcurves 4, 6 and 8.



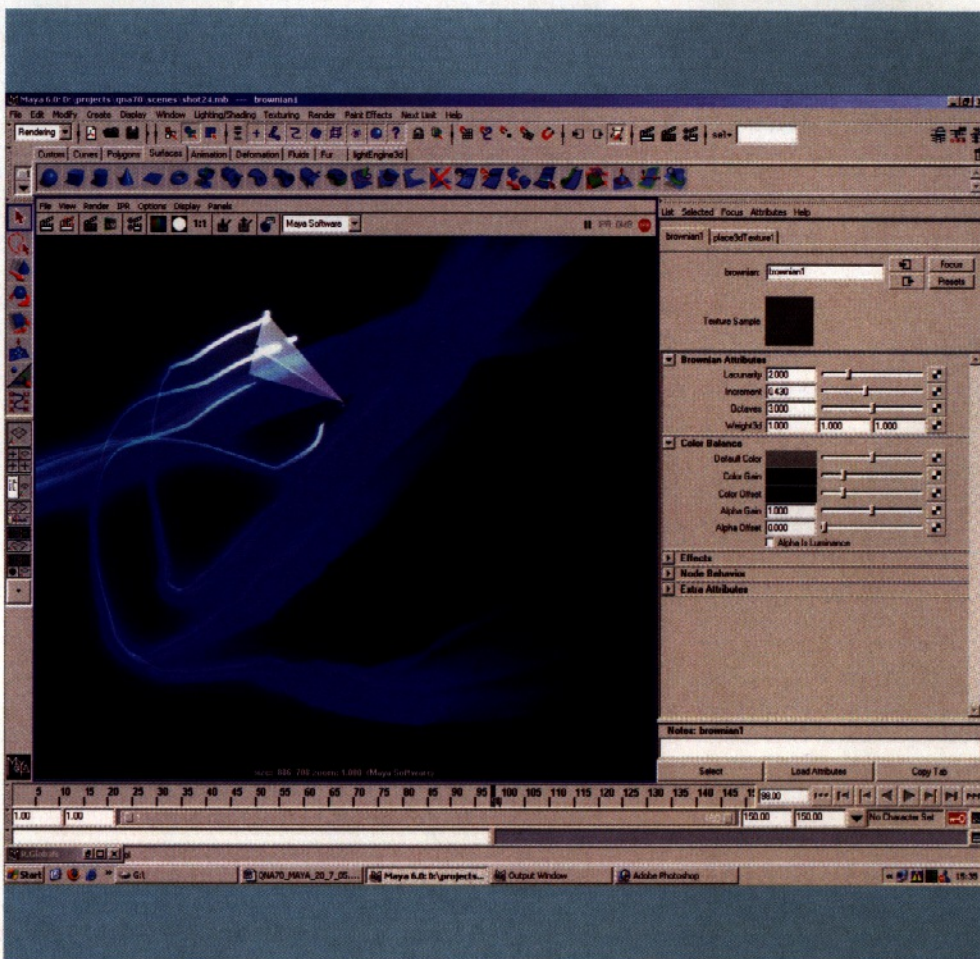
21 An error report will appear about extrude nodes falling to compute, but this is only because they're animating from 0, so don't worry about it - it won't affect your rendering. Save your scene and take a quick breather. Done that? Let's move on and make a wispy shader.



22 Next, assign a Lambert shader to the tubes with its transparency set to 0, and a colorRamp in its incandescence. Edit the ramp's colours so the colour fades out. Now pick the middle colour and click its checkbox to add a ramp to that. If your first ramp was a V ramp, make this one a U ramp and add a greater degree of colour variation, plus a little noise.



23 Everything's OK so far, but it could do with some radiance. In the Lambert shader, set your Glow Intensity to about 0.3. In your Hypershade, select the shaderGlow1 and click off the autoExposure attribute. Twiddle the glow and halo values until you end up with something less neon. If you want, you can select the Lambert shader again and, above Glow Intensity, click on Hide Source.



24 You've got some good trails there. The nicest thing to add to the effect would be a little displacement, giving the impression of light dissipation. Making sure you've turned off feature displacement for each surface, create a black-to-dark-grey ramp and connect it to the Lambert shading group's displacement. Change its interpolation to Exponential Down and set the black point to about 0.75.

Now click the dark grey colour's checkbox and add a Brownian. Set the Lacunarity to 2 and the Octaves to 3, then edit its Color Offset and Color Gain to about 0.2. This gives you a shader that should displace and distort towards its rear. Increasing the tube's surface tessellation will reduce the jagged nature of the displacement, but be aware that this will ultimately slow down rendering time. ●

Q&A

Our experts
this month ...

3DS MAX

Pete Draper is the VFX Director at Lightwork. His car looks like quads and tris have been mixed up before smoothing
www.xenomorphix.co.uk

CHARACTER STUDIO

Chris Ollis works as a character artist and animator at Codemasters. He hopes to one day find an answer to it all.
www.intertwined.co.uk

CINEMA 4D

Adam Watkins is the Director of Computer Graphic Arts at the University of the Incarnate Word in San Antonio, Texas
www.cgauhw.com

COMBUSTION

Andrew Tanousis is a Combustion and 3ds Max tutor. He denies cheating when he finally cracked the Bedlam Cube
andrewtanousis@hotmail.com

DAZ STUDIO

Lisa Buckalew is a CG artist, product coordinator and content developer for the Platinum Club at DAZ Productions
www.mysticalmodality.com

HEXAGON

Mike de la Flor is a medical illustrator and instructor, and wrote *The Digital Biomedical Illustration Handbook*
www.delafior.com

LIGHTWAVE 3D

Benjamin Smith is Creative Director at Red Star Studio. Despite a month of medication, his clusters are still aching
www.redstarstudio.co.uk

TRUESPACE

Andy Kay is a UK-based freelance 3D modeller specialising in product visualisation and architectural illustration
www.andykay.org.uk

XSI

Ola Madsen works as a 3D artist for a company in Sweden, animating everything from medical treatments to cute teddy bears
www.digitalcontext.se

Quick Questions

No matter which 3D software package you use, our experts are here to help. Send us your query and we'll provide the solution: <http://forum.3dworldmag.com>



With C4D 9.5's new options to allow polygons or splines to be area lights, creating believable neon is easier than ever

CINEMA 4D | Neon with Cinema 4D 9.5 Area Lights

Q How do I make effective neon signs that look as though they're emitting light? **JAMIE PRANGNELL, VIA EMAIL**

A We've covered neon before in Q&As of yesteryear, looking at ways of faking the actual light that the neon sign gave off. Clumsily, we created light sources that mimicked the light that would be coming off the energized neon gas. Among the new additions to C4D's most recent release (9.5) are new lighting techniques that allow for more believable results when creating neon.

In previous versions of C4D, unless you were using long-rendering radiosity techniques, you were limited in the shapes of your light sources. If you weren't using straight tubes, points, spotlights or square area lights, you were out of luck. In 9.5, you can select any object and have that object actually emit light.

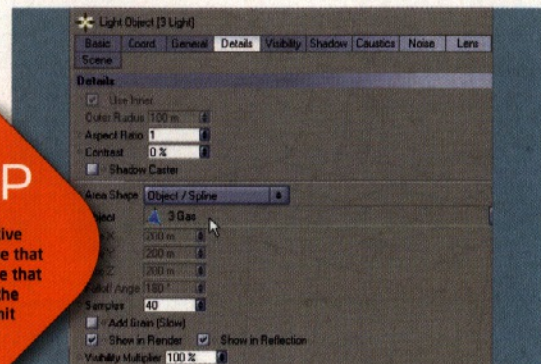
The way that C4D does this is by creating an Area Light (Objects > Scene > Area Light). Through a sort of proxy process, you can choose to have an Area Light emit its light from either a spline or a polygonal object. When you create an Area Light, double-click its icon in the Objects Manager. In the Attributes Editor, you can then change the settings. In the Details tab is an area called Area Shape. Here, you can define what sort of shape this light is to take, including selecting Object/Spline. You can

then drag any object or spline from the Object Manager into the Object input field. The light will then emit from that object. If you move the object, the emitted light goes with it.

For a neon light, you simply create an area light with the colour you wish the neon to appear as. Change the Area Shape to Object/Spline and drag the geometry from the Object Manager into the Object input field - voilà! The geometry that defines the neon sign will also emit light, as a neon sign actually would. **[AW]**

Q&ATIP

The most effective neon includes a shape that acts as glass, and one that acts as gas. Use the gas shapes to emit the light

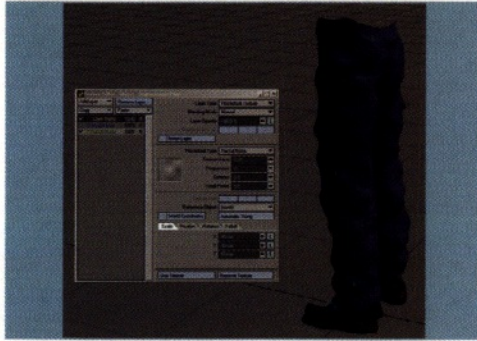


The key to simulating a neon sign lies within the new Area Lights options. Here, you can define any collection of polygons to emit light



LIGHTWAVE 3D | Is there a way to control cloth deformations with a UV or Weight Map?

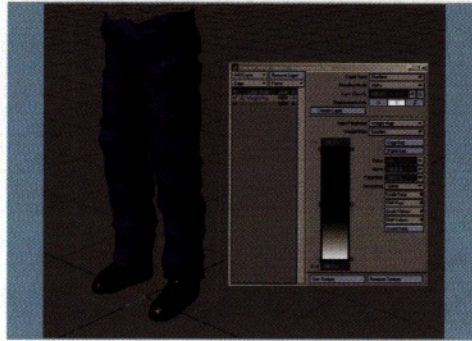
HARLEY BODEN, VIA EMAIL



01

Setting texture values

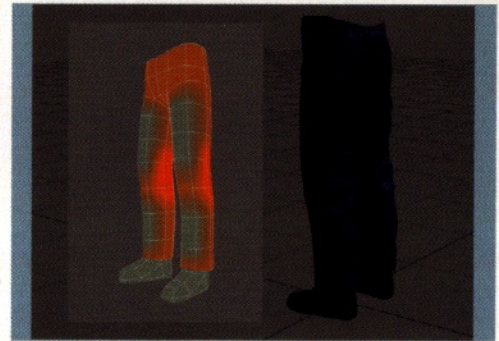
Load 'legs.lwo' from the CD and apply a Procedural Texture displacement map from the Object Properties panel. Make the type Fractal Noise, set Texture Value to 0.01, frequencies 1, and then set Scale to 50mm, 30mm and 50mm respectively. This gives you some nice semi-realistic wrinkles (set the SubPatch resolution higher if you need to), but it affects the shoes, too.



02

Adding keys

Add a new Weight Map layer over Fractal Noise. Set Blending Mode to Alpha and Input Parameter to Weight Map > Trousers. Add keys as in the image above - two black ones with 0 value and then a white one with a value of 1. This scales the displacement by the Weight Map, eliminating the wrinkles from the feet.



03

Losing weight

Inspect the Trousers Weight Map in Modeler. If you reduce the overall weight of the trousers to 50% (select them and use the Set Map Value tool on the Map tab for precise control), you can make the backs of the knees 100% and the fronts of the legs 10% to precisely control where the wrinkles occur. [BS]

SOFTIMAGE XSI | Getting to grips with tyres

Q

I've tried modelling a detailed tyre using different techniques, but can't get it right. What's the easiest way to approach the problem?

ROBERT, VIA EMAIL

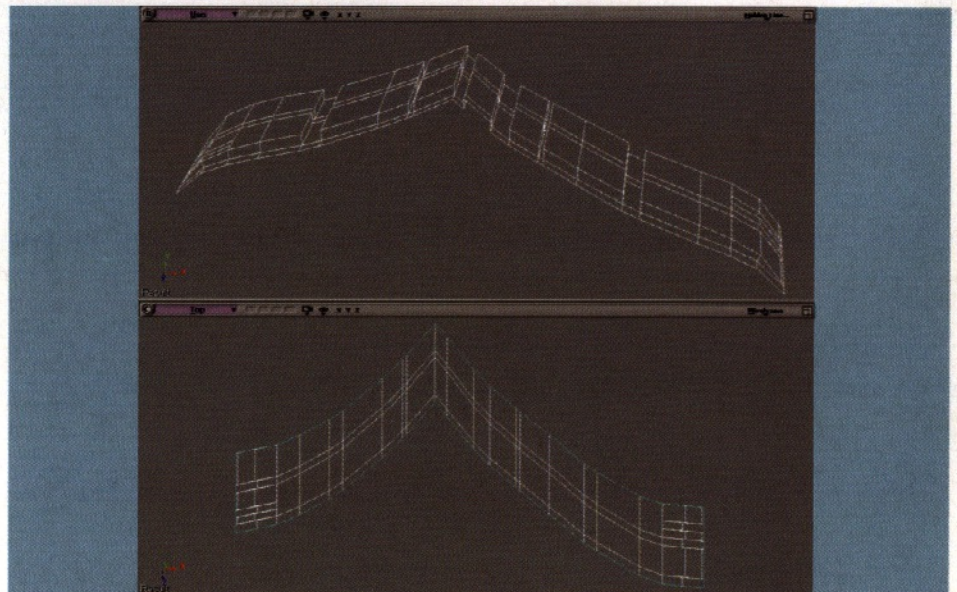
A

The first thing to do is to get hold of good reference material, which can easily be obtained by searching Google. After settling on what type of tread pattern to create, load it as a Rotoscope Image in XSI or use it as it is.

Create a grid and lower the Y Length to 1.5. Increase the U Subdivisions to 19 and the V to 2. Select the middle V edge row and, in the top viewport, move it downwards so it's just above the end of the grid. Move each of the U edge rows to form the gaps between the treads. Next, move the polygons so you get a V-shaped pattern. Select all the polygons that will form the height of the tread, press [Ctrl]+[d] to duplicate them and move them slightly upwards. With the polygons still selected, from the Modify > Poly.Mesh menu, choose Bevel Components.

THE FIRST THING IS TO GET HOLD OF GOOD REFERENCE MATERIAL

With your object selected, press [Ctrl]+[Shift]+[d] to open the Duplicate Multiple PPG. Enter 45 as the number of Copies and switch to the Transform tab. In the Z Translation box, enter 1.5 and click 'OK'. Select all objects and, from the Create > Poly.Mesh menu, choose Merge. Lower the Tolerance to about 0.1 and click the 'Delete' button in the PPG to freeze the new object. In the Transform Panel, click Transform > Move Center to Bounding Box before applying a Modify > Deform > Bend operator. In the PPG, change the Axis to Z and set the Angle to about -382. Change the Radius to 11 and set the Z Offset to -37. To weld the seam together, choose Modify > Poly.Mesh > Boundary Points/Edges. Hold down the [Alt] button and click with the middle mouse button on one of the edges at the very end at each side of the tyre (hold down [Shift] to add to the selection) to select the entire row/loop. Duplicate the edges and scale them down a couple of times to form the side of the tyre. [OM]



Q&ATIP

Take your tyre even further by adding additional details with the use of bump and/or displacement maps

By focusing on a single section of the tread pattern, you can allow more attention to go into the details - a technique that works for any tyre

Save different versions of your scene before you freeze the object to ensure you'll easily be able to go back and make changes to the original tread pattern



DAZ STUDIO | Creating reflections on the surface of water

Q Are there any tips or tricks to setting up a water surface in DAZ Studio?

KAREN, VIA DAZ STUDIO FORUM

A In DAZ Studio, the Reflection Color and Reflection Strength of a material determines how reflections are rendered for everything around that material. As seen in the first image opposite, white Reflection Color at 100 per cent will render perfectly mirrored reflections. When set to black, there will be no reflection at all.

The reflective surface can be affected by changing Reflection Color. Set the Reflection Color the same as Diffuse Color to make coloured reflections, or use various shades of grey for deeper reflections without affecting the colour.

Diffuse Color and Diffuse Strength have an effect on the reflection. With Diffuse Color white, Strength 0 per cent, Ambient Color black at 100 per cent and Reflection Color white at 100 per cent, the rendered effect is a perfect mirror. Increasing Diffuse Strength lightens the reflecting surface and the reflection. At 30 per cent, the reflection begins to be muted; 70 per cent and it becomes washed out or 'milky'; at 100 per cent, it's hardly discernable.

Refraction Strength and Index of Refraction control the angle of reflection and refraction. Rotating the camera to look directly into the reflective surface will make the reflections less visible. Enhance them by increasing the Refraction Strength and Index of Refraction. Little reflection will be achieved if lights are pointed directly at the reflective surface. Position lights to the side of the object that you want to reflect.

Texture can be combined with colour for more interesting effects. In the second image, Diffuse Color was changed to light green, Diffuse Strength to 30 per cent, and an image representing water was loaded into the Diffuse Color property. Applying texture to the Diffuse Color and increasing Diffuse Strength mixes colour and texture without washing out the reflection. Ambient Color was changed to white, and an image of a cloud-filled sky was added into the Ambient Strength property. This is useful for adding atmospheric influences to a surface when there's no sky dome present in the scene.

A greyscale version of the water image was loaded into the Reflection Strength property. This helped to create a glimmer on the water surface. **[LB]**



● In the picture on the left, white Reflection Color renders mirrored reflections, but when it's set to black, as illustrated in the picture on the right, there are no reflections at all



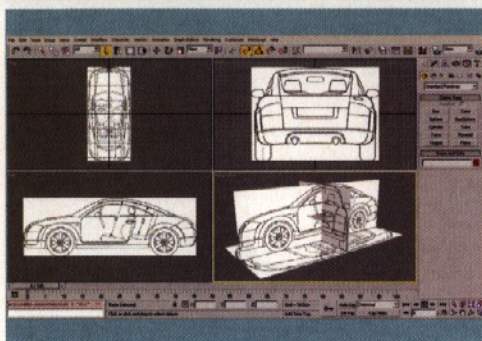
● Incorporating texture and custom settings for Diffuse, Ambient, Reflection and Refraction properties enables you to create a reflecting water surface within DAZ Studio. The scene file for this image can be found on the CD for you to deconstruct

Q&A TIP

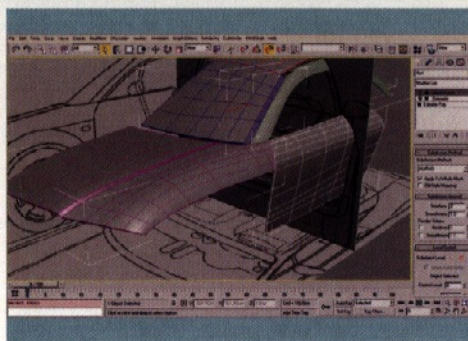
● Use a cloudy sky image to add atmospheric influences to your water surface when there's no sky dome present in your scene

3DS MAX | I'm having trouble modelling a car. Can you offer any tips?

JOSHUA KALES, VIA EMAIL.



01 **Starting with the blueprints**
If you're working from blueprint plans, ensure (before you start modelling) that these plans actually line up correctly. You should be able to drop them into Photoshop and each line should match exactly. When laid out in Max, try to insert polys only where necessary to rough out the body shape to begin with, following the contours of the blueprints.



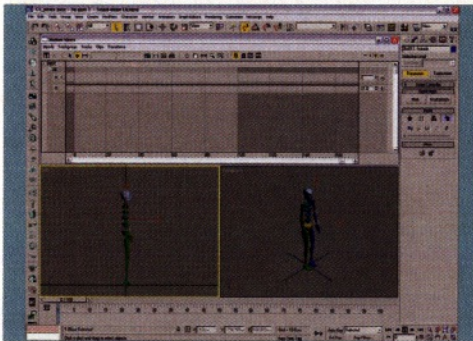
02 **Quads and Tris**
Pay attention to panel outlines when refining, and try to keep your edge loops consistent and flowing over the car. Try to keep the mesh as one solid piece and then detach individual panels later to add refinement and panel depth. Stick to one poly type - quads or tris. Don't mix the two or you'll see pinching in the mesh. If you need to mix, keep them at the panel edges or corners, and really small.



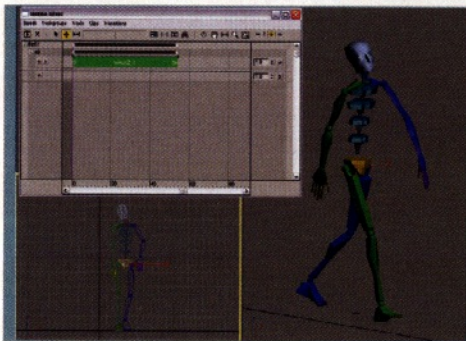
03 **Testing the mesh**
Create and apply material with a strong specular material to the object to test for kinks and dents in the mesh. If you position the viewport accordingly, you should see an unbroken highlight as you would on any normal, undamaged car. If for any reason this highlight varies in intensity, you've got a problem in the mesh and should be able to spot it and fix it without too much trouble. **[PD]**

CHARACTER STUDIO | How do I merge two motions together on a single character?

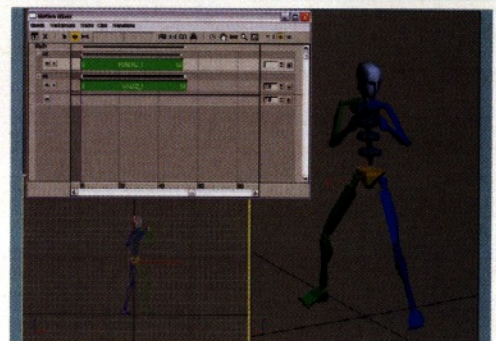
PETER M, VIA EMAIL

**01** Accessing the CD

Open the file 'CS_Mixer.max' on this issue's CD. It contains a standard biped skeleton that currently has no motion applied. Select any bone and open the Motion Panel to access the *Character Studio* toolset. From the top Biped Applications section, select the Mixer button to launch the interface.

**02** Adding movement

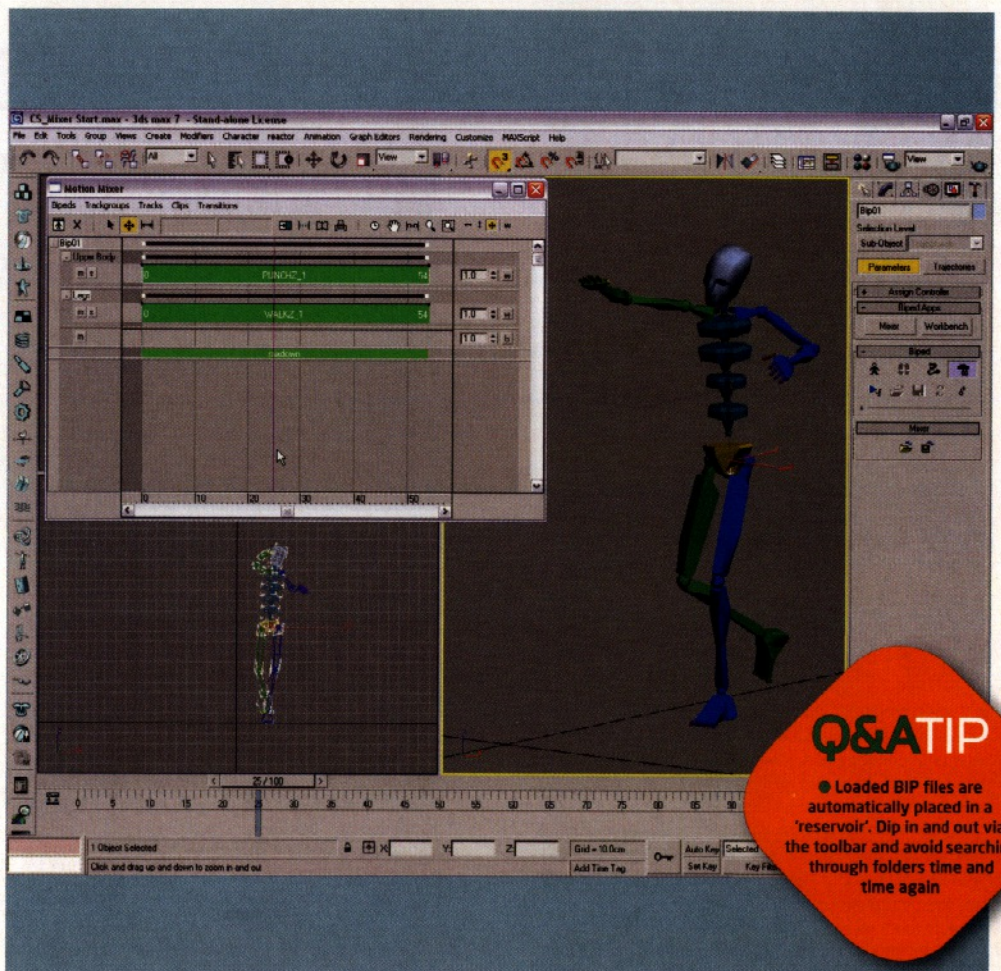
On the first line next to the boxes labelled 'm' and 's', right-click and select New Clips > From Files. Load the *Character Studio* motion file 'Walk.bip' from the CD. The file will appear as a coloured line showing the duration of the motion. Scrub the timeline to see the biped move.

**03** Adding Trackgroup

Now select the Mixer panel again and right-click on 'Bip01' and choose Add Trackgroup. In the new bar that appears, right-click again and pick New Clips > From Files. This time, select the 'Punch.bip' file from the CD. If you scrub the timeline now, you'll see the moves are mixed together very badly!

**04** Lining things up

For a start, the walk cycle is two frames longer than the punch, so the character jumps to the walk position as soon as the punch has ended. To quickly and simply fix this, just grab the end of the 'Punch.bip' file in the mixer and drag it to frame 54 to line up with 'Walk.bip' below it.

**Q&A TIP**

Loaded BIP files are automatically placed in a 'reservoir'. Dip in and out via the toolbar and avoid searching through folders time and time again

**05** Blending the moves

Right-click where it says 'All' on the 'Punch.bip' Trackgroup and select Filter. A small window will appear that reveals which parts of the biped the motion capture is affecting. Deselect the legs and hip sections as shown, so that the punch moves only apply to the upper body, then rename this filter 'Torso' in the bottom box.

06 Mixing down to finish off

Right-click where it says 'All' on the 'Walk.bip' Trackgroup, select Filter and deselect the upper torso as shown, so that the walk only applies to the legs and hips. Again, rename this Filter 'Legs' for easy reference. Scrub the timeline and you'll now see the biped walking along, punching as it goes. To actually apply this data to the

biped (it's currently only working on a Mixer level, so deselect the Mixer icon on the Motion Panel and your biped returns to a start pose!), you must right-click 'Bip01' in the Mixer and select Compute Mixdown. Hit 'OK' to accept the default settings, and once the Mixdown track has appeared, right-click it and then select 'copy to biped' to apply the blended moves. [CO]

TRUESPACE | How do I work with models created in other applications?

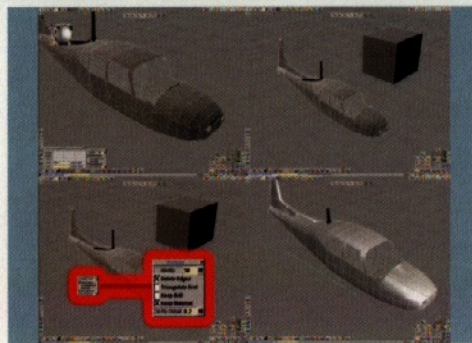
HENRY MIDGLEY, VIA EMAIL



01

It's all one object

If an object has been exported as a single object when it's actually a group, we have to use the Decompose Into Individual Objects tool to create a hierarchy that *trueSpace* can understand. Once you've applied the tool to your object, individual components can be selected using either the Object Properties dialog, or the object tool, in conjunction with the hierarchy navigation tools.



02

Too many triangles

Object formats such as 3DS use triangulated meshes, whereas *trueSpace* works with Quads. We can remove triangulation using the Boolean tools and a trick called a 'remote Boolean'. Load a second object and ensure it's not touching the main object. In the Boolean dialog panel, select 'delete edges' and subtract the new object. Note how the triangles disappear yet leave your original mesh intact.



03

Filling in the holes

Many imported meshes will have flipped faces or normals. These appear as holes in your mesh. If the majority of the object is reversed, use the Flip All Faces tool initially, then select the individual faces using the Flip Face tool. Once all of the faces are aligned, you can use the Fix Bad Geometry tool to correct any mistakes in the mesh. Then you're ready for texturing. [AKJ]

HEXAGON | Welding objects

Q

Which weld tool do I use to join the halves of an object, and what does the Connect tool do?

VINCE MARCO, VIA THE HEXAGON FORUM

A

As a dedicated modeller, *Hexagon* features no less than four different weld tools for joining vertices, edges and objects. The weld tools are Weld Points, Average Weld, Target Weld and Object Weld. All weld tools reside in the Vertex modelling toolbar, except for Object Weld which is in the Utilities toolbar. Though the weld tools have similar functionality, each tool has a specific use. And though the Connect tool sounds like it would join objects, it does something completely different.

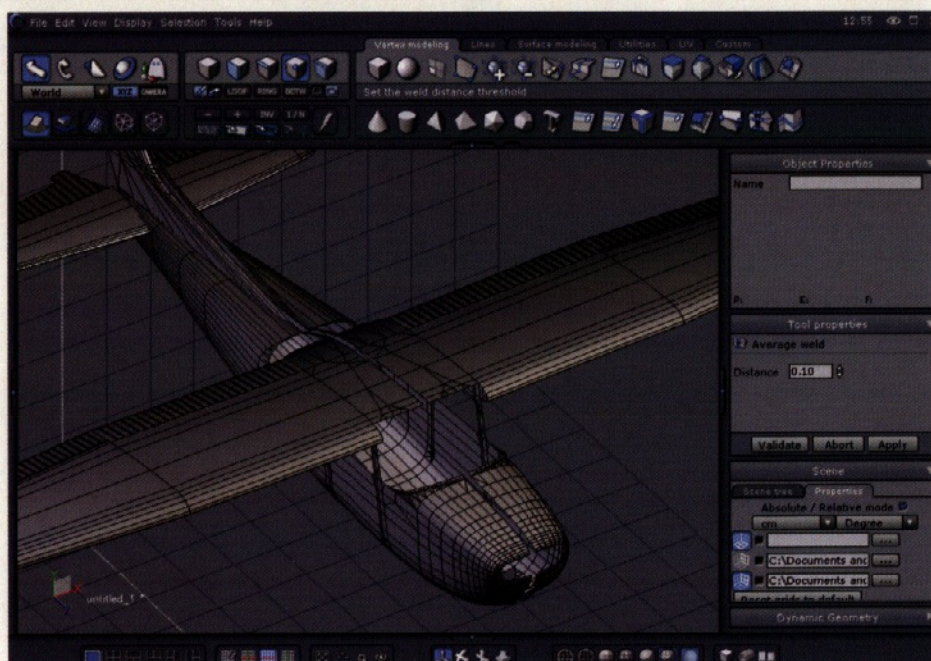
The basic weld tools in *Hexagon* are Weld Points and Average Weld. Weld Points joins two vertices on the same object or between two different objects. Weld Points easily reduces the number of vertices and edges, but is not efficient for welding

THE CONNECT TOOL HAS NOTHING TO DO WITH JOINING MESHES

two objects together. On the other hand, Average Weld is perfect for joining symmetrical halves. To use Average Weld, select the halves, click on the Average Weld tool once to combine the objects and then click on it once more to join vertices based on a distance tolerance.

Target Weld will only join edges and vertices on the same object and is better used as a modelling tool than a welding tool. The last weld tool that *Hexagon* features is Object Weld. This tool doesn't really weld objects together, but it will take two separate mesh objects and make them one object, even if they're not physically touching - not too different from the Boolean union function in which objects don't overlap. Weld Object is useful if you want to quickly combine several meshes into one complete mesh.

Finally, it may seem a bit confusing at first, but the *Hexagon* Connect tool has nothing to do with joining meshes together. In practicality, the Connect tool is a type of tessellation tool that creates new polygons by connecting two vertices with a new edge. [MDLF]

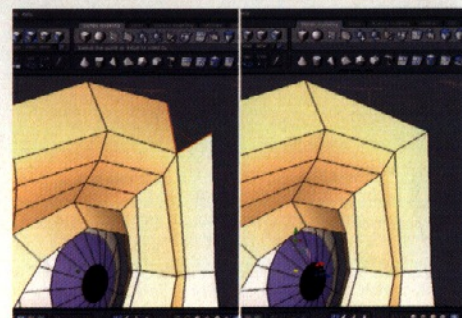


Q&A TIP

Hexagon has specific tool activation and termination commands. Pay attention to the Tool Properties when welding to get information on what the current tool is doing

Though the Average Weld tool is not so intuitive at first, with a little practice, it's easy to join symmetrical halves with just a couple of mouse clicks

Unique to *Hexagon* is the Target Weld tool, which quickly joins edges and vertices while modelling





COMBUSTION | Rendering passes

Q I hear rendering passes is common practice in a production environment. What are passes and how do I go about rendering them out of my 3D application, compositing the layers in *Combustion*?

ANDY TYLER, VIA EMAIL

A Rendering passes is the process of rendering different attributes of your scene separately. The most common types of passes you can render are Diffuse (Beauty), Highlight, Reflection, Shadow, Lighting, Effects and Depth. By combining and adjusting different passes in a compositing application, a scene can be fine-tuned interactively without being rendered, and subtle details and effects can be accurately colour corrected and matched to a film background plate. If you're using *3ds Max*, you can use the Render Elements Tab in the Render Scene dialog to render out separate passes and save them to specific directories. You can even use the Output to Combustion function, which creates a layered *Combustion* workspace based on the elements rendered.

In *Combustion*, you create a new layer for each of your passes before adding post effects on-the-fly. Essentially, the Technical Director will composite the shot, and this is a powerful method that will allow him freedom and control.

Open up the *Combustion* Workspace and load 'floor.tiff', and continue to load in Diffuse, Specular, Shadow, Reflection, Lighting, Blend and Ambient Occlusion. Make sure each one is on its own layer. Once the layers are loaded, you can go in and play around with different settings in the Composite Controls/Surface options, and you can also add a Gaussian Blur operator to soften shadows, or a Discreet CC Colour Corrector to change the diffuse or highlight colour. You can use any of the Transfer Modes settings to attain the look you desire. You have total control over transfer modes and opacities of the renders you're working with. In your 3D application, render out an Ambient Occlusion pass - added to the top layer of your composite, it brings things to life. Once harnessed, this way of working will change the way you render and speed up your workflow, which is crucial in an environment where changes are made right up to the closing bell. [AT]



Q&A TIP

● *Combustion* has a great level of integration with *3ds Max*. You're able to render out separate passes from *Max* straight to a *Combustion* Workspace

● Rendering an Ambient Occlusion pass from your 3D app gives your scenes softer, more realistic looks

● You can add a Discreet CC Colour Wheel operator to the Reflection layer



CONUNDRUM | Send us your solutions to this month's brainteaser

Each issue, we set you a real-world 3D problem to solve. The sender of the best solution wins the book or training DVD shown on the right. Our conundrum for last month was posed by *LightWave* user Ed who asked:

"How do I achieve the effect of objects looking paler and more blurred the more deeply they're frozen in ice?"

The first solution was posted by 'Pete', who suggested the following technique: "I got decent results by creating a box with 100 boxes inside, each slightly smaller than the next one, then setting transparency to 99% or so. Each new box the light passes through reduces its strength by 1%, making it look as though an object embedded in this 'ice' gradually disappears into it."

A rather more sophisticated solution was supplied by Zibi, who wrote: "Fortunately, there is no need for fancy plug-ins here. Just create your ice texture with a gradient in the Transparency channel set to Surface Thickness - you probably want the maximum transparency to be only about 50% and the minimum at 0%. Make the end distance about the same as the deepest object you want to see."

"You can play around with something similar on Translucency for that icy effect as well if needed, although a high value will tend to invert the tones, so keep this low. You will also need to

check Double Sided to avoid strange tone inversions. Next, go into the Environment tab and turn up Refraction Blurring to 80% or so. Make sure you turn on Raytrace Refraction in Render Options as well.

"Lastly, you might consider using a bit of depth of field to really give it some depth blur - but be warned: if you do so, you will need to take a holiday while your scene renders."

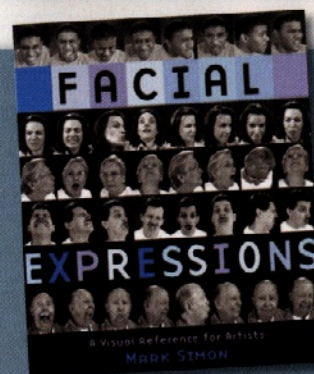
The solution was also accompanied by a screenshot of the results, which can be seen on the thread on the *LightWave* section of the forum. Congratulations to Zibi: a copy of *Facial Expressions* is in the post to you.

THIS MONTH'S QUESTION

Our question for next issue requires *Cinema 4D*, and is posed by sribas, who asks:

"How can I have the shadow of a house projected in an invisible floor plan, so I can have only the shadow projected in a background image. In other words: I have a background landscape picture and a 3D house, and I want the shadow of this house to be projected on this background image."

Post your solutions in the Mag Related or *Cinema 4D* sections of the forum, or email them to us at the address on the right.



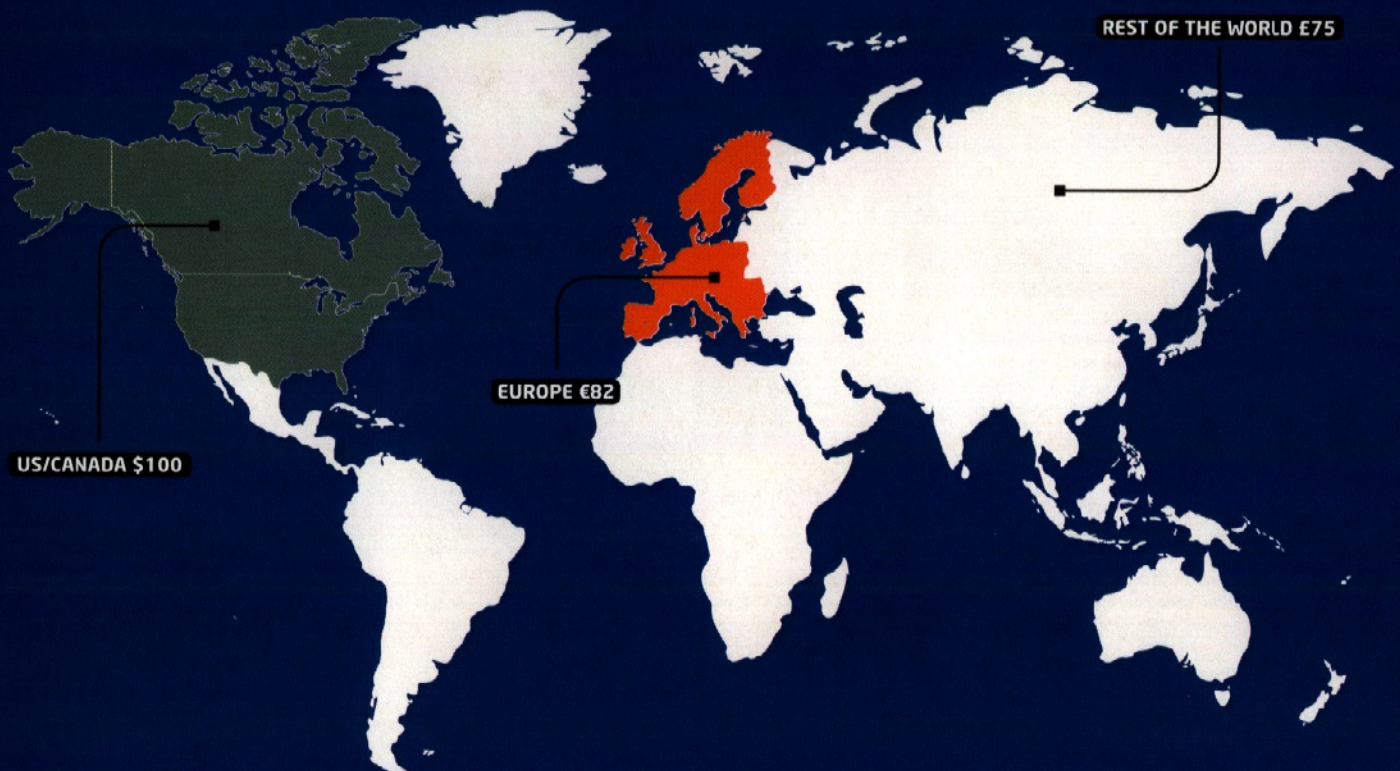
This month's prize

Send in your solution to this month's brainteaser and you could win a copy of *Facial Expressions - A Visual Reference for Artists* by Mark Simon. An invaluable aid for character animators, the book contains images of over 50 male and female models with ages ranging from 20 to 83, photographed in a variety of facial expressions and from multiple angles. For more information, visit www.watsonguptill.com

To enter, post your answers on our forum <http://forum.3dworldmag.com>

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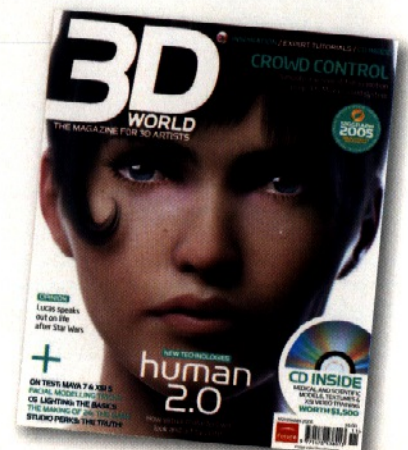


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So real it renders fear.

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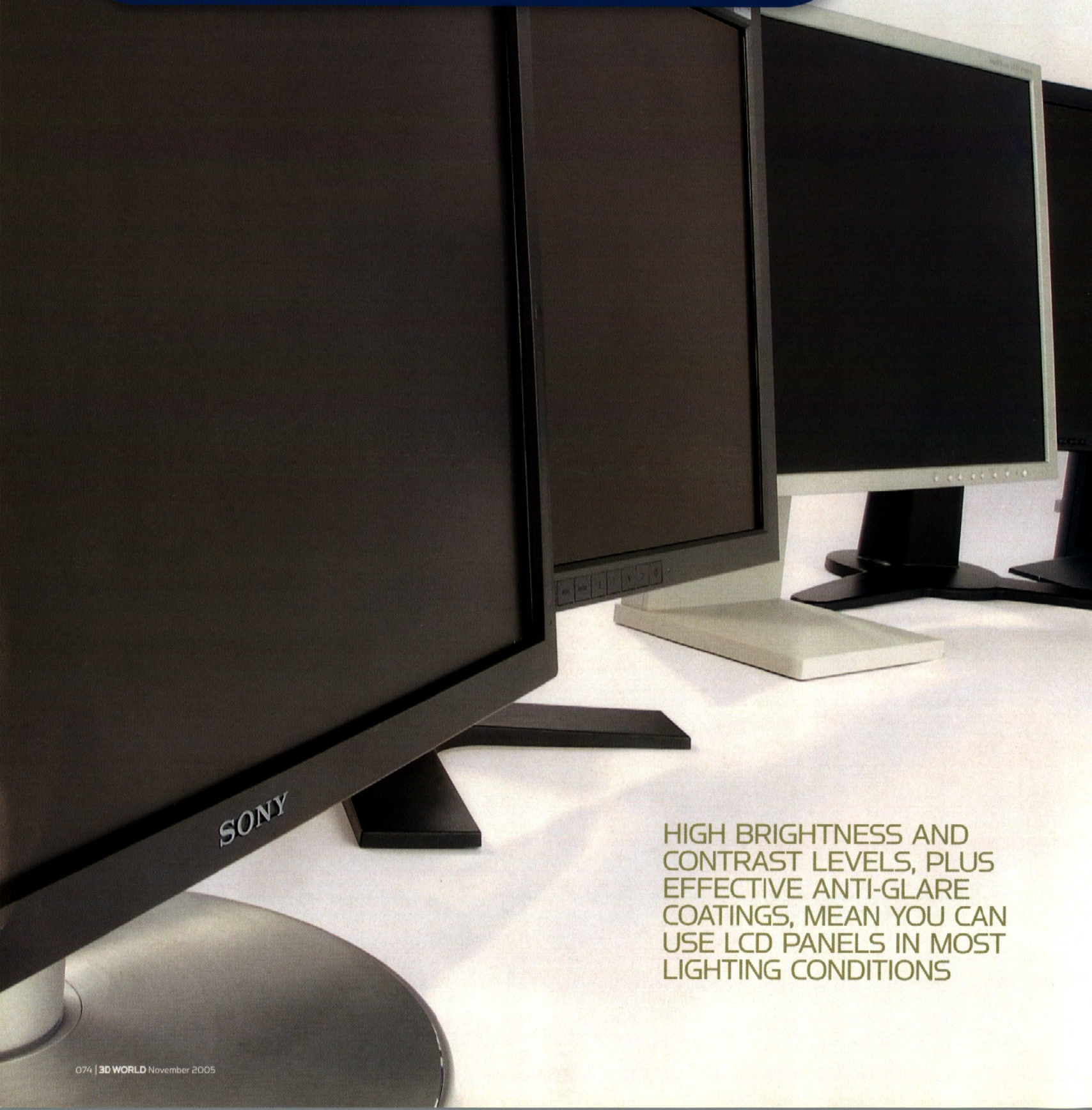
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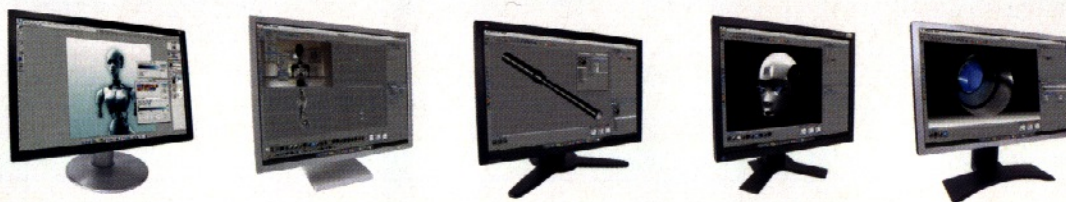
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REVIEWS

HARDWARE / SOFTWARE / BUYERS' GUIDE



HIGH BRIGHTNESS AND CONTRAST LEVELS, PLUS EFFECTIVE ANTI-GLARE COATINGS, MEAN YOU CAN USE LCD PANELS IN MOST LIGHTING CONDITIONS



LCD monitors

GROUP TEST A large LCD monitor can transform your entire working environment, but which should you buy? Here are five worthy contenders **BY MAT BROOMFIELD**

Powerful processors and graphics cards are crucial to 3D artists, but none of these will give you as much pleasure in your day-to-day working life as a large LCD monitor. High brightness and contrast levels, plus effective anti-glare coatings, mean you can use modern LCD panels in most lighting conditions. Even better, because there's no screen curvature, you don't get reflective 'hot spots' on parts of the screen that catch the light.

CRT monitors use an analogue interface to your computer, and the resolution of the image that's displayed has no correlation to the resolution of the phosphor elements used to coat the screen; this creates a slight softness to the image. However, LCD panels use a fixed array of LCD elements, which work best at a specific resolution, or at precisely half that value (1,600x1,200 or 800x600, for instance). Furthermore, LCD screens connect to your computer using a digital interface, so provided that your graphics card has a digital output, there's no signal-degrading analogue-to-digital conversion process.

The combination of these two factors produces a ceaseless array of images that are amazingly crisp.

If you're going to be spending long periods of time in front of a screen, ergonomics are vitally important. A screen with few adjustments can lead to neck or back aches, strained eyes and poor posture, which is why we didn't include the stylish, but minimally adjustable Formac monitors in this test. A bare minimum in our book

is the ability to change the tilt angle (to avoid reflection) and the height. Some models include a rotating base, and a few enable you to swivel the screen to change its aspect

NONE OF THESE WILL GIVE YOU AS MUCH PLEASURE AS A LARGE LCD MONITOR

ratio from landscape to portrait, so you can make more use of your workspace. It sounds like a great idea, but we've been using one in our office for years, and never find the need for such a feature.

Speaking of aspect ratios, a number of the screens in this test offer a widescreen ratio of 16:10. This is ideal for film industry work, where you may be viewing or editing widescreen cinematic imagery.

So, check out these five flat mates to discover which one you'd like to move in with you.

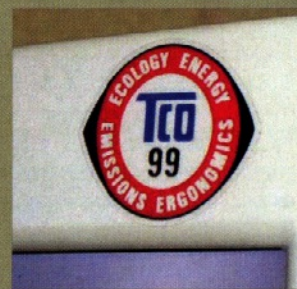
● Reviewed this issue: the Sony SDM-P234, Eizo L997, NEC LCD2180UX, ViewSonic VP231wb and BenQ FP231W

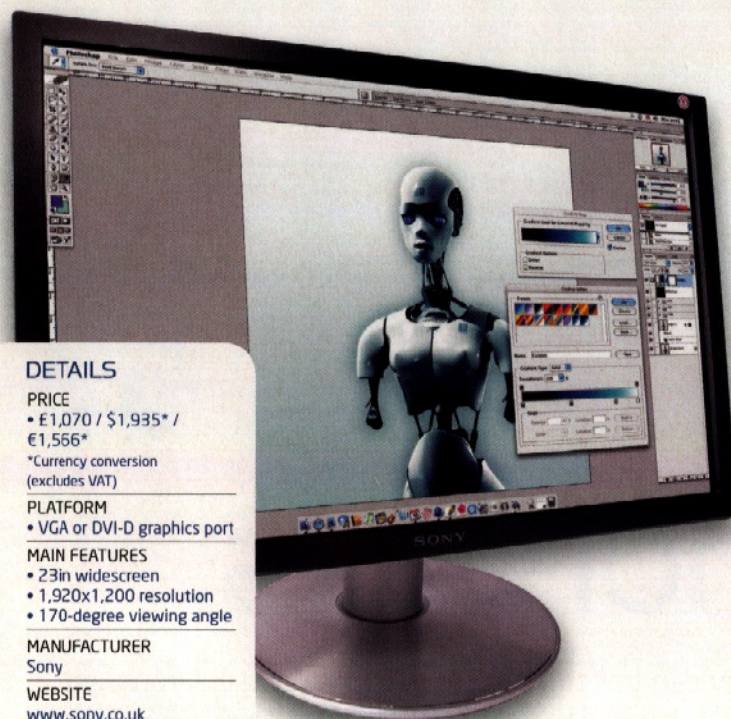
TALKING POINT | Protecting your health and saving you money

ALL PIECES OF computer equipment are eligible for TCO certification, but what exactly does it mean? Well, this valuable award acknowledges, among other things, the environmental friendliness, degree of power economy and ergonomic functionality of any product.

As far as monitors are concerned, the most important certification is TCO '99, which sets all the important criteria.

However, there is an even newer certification: TCO '03, which most monitors fail to achieve by simple virtue of the fact that they use a black bezel (the plastic bit surrounding the screen). This creates a high contrast between screen and surround, and affects your eyes' perception. Only monitors with a cream or grey surround will achieve this most stringent of awards.





DETAILS

PRICE

• £1,070 / \$1,935* /
€1,566*

*Currency conversion
(excludes VAT)

PLATFORM

• VGA or DVI-D graphics port

MAIN FEATURES

- 23in widescreen
- 1,920x1,200 resolution
- 170-degree viewing angle

MANUFACTURER

Sony

WEBSITE

www.sony.co.uk

Sony SDM-P234

In the past, you paid a high premium for Sony's indisputable style, but could times be a changin'?

Now that panel manufacturing is more reliable, companies can not only reliably fabricate large panels such as this one, but they can do so at an affordable price.

This panel offers a widescreen aspect ratio of 16:10. Widescreen TV is 16:9, so this gives you extra width for toolbars when you're working on zoomed images. In terms of resolution, it offers WUXGA, which means a native resolution of 1,920x1,200. The monitor offers different modes for coping with resolutions that don't match the aspect ratio of the screen: it can stretch an image to fit the screen, maximise the image in one axis and place black borders at the edges, or it can display at 1:1 (one monitor pixel equals one computer pixel), which means black borders on all sides.

The SDM-P234 is a joy to use. You can change the colour temperature to make the display warmer (more red) or cooler (more blue), and you can select the sRGB colour space for online colour matching. You can also select different gamma to match digital cameras and printers.

At 400:1 the unit has the lowest contrast ratio of all of the reviewed

models, but viewing this alongside, say, the Eizo with its 550:1 contrast, it's hard to tell the difference. At 250cd/m², the unit has the same high brightness level as all the others. You can reduce the brightness, of course, and reduce the backlight illumination to lower the power consumption. Speaking of which, the P234 incorporates an optional technology called Eco, which analyses ambient light and adjusts the brightness to reduce power consumption from 72 watts to 46.

With two analogue inputs and one DVI-D input, this monitor can be connected to three computers at once, enabling you to switch between them as needed. It's stylish, great for video work, and has very straightforward controls.

VERDICT

PROS

- Very stylish
- Large size
- High resolution

CONS

- No height adjustability
- Below-average contrast ratio

RANGE OF FEATURES

7

VALUE FOR MONEY

7

OVERALL

7



DETAILS

PRICE

• £799 / \$1,445* / €1,169*

*Currency conversion
(excludes VAT)

PLATFORM

• VGA or DVI-D graphics port
(portrait mode software for
Mac / PC only)

MAIN FEATURES

- 21in screen
- 1,600x1,200 resolution
- Ambix provides three
types of computer input

MANUFACTURER

NEC Display

WEBSITE

www.nec.co.uk

NEC LCD2180UX

With simple, classic styling, here's a monitor that hides clever technology beneath its plain exterior

The 2180 is the cheapest monitor in our round-up, but there's great functionality here. It's the smallest of all the monitors we looked at, too, but 21in corner to corner and a 1,600x1,200 resolution give plenty of space to work with.

With a contrast ratio of 500:1 and a maximum brightness of 250cd/m², the panel appears average, but there's an extra clarity not present in most of the others. Having said that, while it has a viewing angle of 176 degrees, a lack of colour purity and a reflective screen mean that mild colour aberrations can appear in some lighting conditions. This is ironic, as the monitor has excellent colour controls, with six-axis adjustability, enabling you to make alterations in RGB and CMYK colour spaces simultaneously.

Although the monitor has fairly unpleasant controls, there is great compensation: software controls on Windows computers (sorry Mac owners). Using the *NavSet* software, you can monitor the screen's performance via your Windows desktop – far more intuitive.

The 2180 comes in a choice of two cases: a black one that has TCO '99

certification, and a silver one that has TCO '03 certification. The latter has a higher TCO rating because the contrast between bezel and screen is lower, enabling your eyes to retain better colour recognition.

For some reason, the monitor didn't handle awkward screen resolutions as it should. In theory, the Aspect mode enables it to maximise non 4:3 ratio screens to the maximum size while retaining the aspect ratio, but this didn't happen when we tested it at 1,600x900.

Considering the cost, we were pleasantly surprised to see that it offers the facility to rotate into portrait mode to better suit A4 pages. Despite the display mode irritation, this really is a great monitor at a reasonable price.

VERDICT

PROS

- Can be adjusted via desktop
- Three monitor inputs
- Good quality

CONS

- Annoying controls
- Screen modes didn't work

RANGE OF FEATURES

7

VALUE FOR MONEY

8

OVERALL

7



DETAILS

PRICE
• £1,020 / \$1,845* /
€1,493*

*Currency conversion
(excludes VAT)

PLATFORM

• VGA or DVI-D graphics port
(portrait mode software
for Mac / PC only)

MAIN FEATURES

• 23in screen
• Portrait and landscape
modes
• 1,920x1,200 resolution

MANUFACTURER
ViewSonic

WEBSITE
www.viewsoniceurope.com

ViewSonic VP231wb

ViewSonic has always offered high performance at a low cost, but are its days of dominance over?



he VP231wb is a 23in
widescreen model with a
native resolution of
1,920x1,200. It has

inputs for analogue and digital
connections, enabling you to connect
two computers at once, switching
between them as needed. It has easy-
to-use menus, but lacks the colour
options of the NEC and Eizo models.

While it appears to have some unique
features, they're not actually that useful.
For instance, it provides the usual range
of colour adjustments: sRGB, temperature,
and custom RGB settings. It also has hue
and saturation parameters. Now,
saturation may be a useful one if you're
looking at washed-out video, but hue?
When have you ever thought to yourself,
'If only my monitor could display all the
blues as reds, the greens as yellows, and
the reds as purples? These are features
that you implement in software packages
to create psychedelic imagery or fix colour
aberrations – they're not features that
you need built into a monitor.

This is also the only widescreen model
to offer a portrait mode, and again, there's
a very good reason why. When you flip a
4:3 ratio monitor around, it pretty much

matches the ratio of a piece of A4 paper.
When you do the same to a 16:10
monitor such as this one, you get a tall,
thin display that's ideally suited to
wallpaper design! That's not to say that
the portrait mode isn't useful – after all,
you still get a large vertical working area,
but compared to a 4:3 monitor, you get
less width for your height.

In case it sounds as though we don't
like this monitor, don't get us wrong: it's a
lovely screen to use. It's just that in the
past, ViewSonic used to provide superior
functionality to the competition at a
lower price, but now the prices are on a
par, and the monitor's unique selling
points are not really that beneficial for
the vast majority of users.

VERDICT

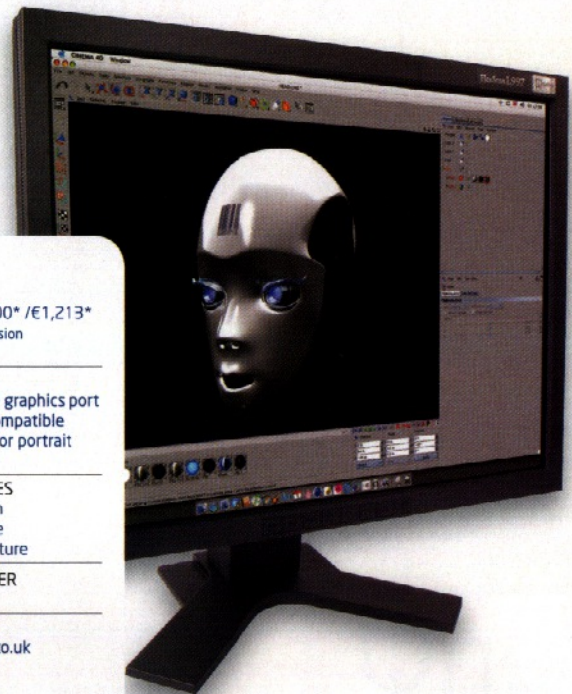
PROS

• High resolution
• Nice controls
• Portrait mode

CONS

• Only one digital input

RANGE OF FEATURES	7
VALUE FOR MONEY	7
OVERALL	7



DETAILS

PRICE
• £829 / \$1,500* / €1,213*

*Currency conversion
(excludes VAT)

PLATFORM

• VGA or DVI-D graphics port
• Requires a compatible
graphics card for portrait
mode

MAIN FEATURES

• 21.3in screen
• Portrait mode
• Picture in picture

MANUFACTURER
Eizo

WEBSITE
www.bechtle.co.uk

Eizo L997

Here's a monitor that's literally dripping with useful functionality, and it has an incredible warranty



he L997 measures 21.3
inches corner to corner,
but offers the same
vertical height as a 23in
widescreen. Like the ViewSonic and
NEC models, you can rotate it to edit in
portrait mode. However, this model
scores over the competition: it doesn't
require software drivers to enable
portrait mode editing, because it's built
into the hardware.

Swivel the screen around and, after a
few seconds, the image will reappear at
the new ratio. Unfortunately, this feature
is only compatible with certain graphics
cards. In landscape mode, the monitor is
compatible with all modern graphic cards.

Of all the monitors in this round-up,
we liked the L997's menu controls the
most, as they're eminently intuitive and
easy to understand. However, like all of
the others, they're not easy to use in the
dark. In this model's case, it's because the
buttons are labelled using embossed,
rather than coloured, decals.

With the ability to display picture in
picture, this is a handy monitor for using
with two computers. But while the BenQ
has inputs that enable you to connect
video sources, the L997 only lets you

connect to a computer, somewhat
reducing the usefulness of the feature.

This monitor has a group-leading
contrast ratio of 550:1 – 10 per cent
higher than the average. However, a far
more significant figure is its extremely
slow 30ms response time. In theory, a
value this high should result in trails or an
after-image when viewing fast-moving
graphics, making it only good for stills
editing. We tested the screen with games
and video and were unable to see any
distortion! Do we have a low sensitivity to
such noise, or has the significance of it
been overstated by the competition? We'll
leave you to decide.

We were impressed. Great features,
and a great five year warranty, too.

VERDICT

PROS

• Portrait mode
• Picture-in-picture
• Great controls

CONS

• Limited inputs

RANGE OF FEATURES	9
VALUE FOR MONEY	8
OVERALL	8

THIS ISSUE'S WINNER

BenQ FP231W

This monitor is as comfortable displaying video as it is with a computer desktop

DETAILS

PRICE

- £1,020 / \$1,845* / €1,493*
- *Currency conversion (excludes VAT)

PLATFORM

- Windows 98SE
- Mac OS 9 / OS X

MINIMUM SYSTEM

- VGA or DVI output

MAIN FEATURES

- 23in widescreen
- 1,920x1,200 WUXGA resolution
- Picture-in-picture
- Multiple inputs including video
- 176-degree viewing angle
- 250cd/m² brightness

MANUFACTURER

BenQ

WEBSITE

www.benq.co.uk



● It's hard to find fault with this stylish LCD monitor from BenQ



When you spend over a thousand pounds on a monitor, you want to be sure that it will earn its keep. This model has been designed to provide maximum versatility.

The FP231W is a 23in widescreen panel with a 16:10 aspect ratio – ideal for handling widescreen video. It's also wide enough to fit two A4 pages side by side at 100 per cent size, making it great for editing double-page spreads. Unlike the ViewSonic widescreen model, you can't rotate the display, but then very few people require this functionality.

Like the Sony and ViewSonic models, it offers a native resolution of 1,920x1,200. It also provides three display modes for dealing with low-resolution images. The first is to simply place the image on the screen in 1 to 1 mode, where each screen pixel is represented by a single LCD element. This produces the sharpest image, but also creates a black border all around the image (and, of course, fails to utilise the full size of the screen). In full-size mode, the computer image is stretched to fit the aspect ratio of the screen, and this usually results in

distortion in the form of image fuzziness. The final mode is aspect, whereby the computer image is scaled up as large as it can get while retaining the same aspect ratio as the original. This usually results in

one output on the top, two on the side and one at the rear, making it ultra convenient to attach additional devices.

If this monitor has a weakness, it's a lack of colour adjustability. It offers colour

WHAT MAKES THIS MONITOR SO USEFUL IS THE SHEER NUMBER AND VARIETY OF INPUTS

black borders at the side of the picture, but the image isn't distorted or too blurry.

What makes this monitor so useful is the sheer number and variety of inputs. In addition to the usual DVI-D digital input, and a VGA analogue input, there are also composite and SVHS inputs for connecting video sources. This is extremely useful: you can treat the monitor as an LCD TV for previewing video footage as you edit.

The monitor also incorporates picture-in-picture, enabling you to see a second input source in a small window in the corner of the screen. This is a real time-saver when you're matching 3D animation with live footage.

In addition to all that, the FP231W also serves as a four-port USB 2.0 hub. It has

temperature, sRGB modes and separate RGB adjustment, but it lacks the detail of the Sony, or the six-axis colour of the Eizo or NEC models. It does conform to TCO '03 ergonomic standards, and for most users, that will be more than enough.

VERDICT

PROS

- High resolution
- Multiple inputs
- Picture-in-picture

CONS

- Limited colour adjustability

RANGE OF FEATURES

9

VALUE FOR MONEY

9

OVERALL

9



THE BENQ JUST MANAGED TO
NUDGE AHEAD OF THE
COMPETITION IN AREAS THAT
PROVIDED GREATER VERSATILITY

CONCLUSION | LCD technology reaches its peak

Some areas of technology still have a lot of evolution left in them; others don't. LCD panels fall into the latter category. They'll get larger and cheaper, and may include more nonessential add-ons, but the core technology is well advanced now, as you can tell when you scan through the specification table and see how similar the core features are (contrast ratio, brightness, viewing angle, response time and so on).

Thus, for our market, any of these monitors can be regarded as excellent. With LCD panels, we tend to be less concerned about colour perfection than overall image clarity and quality. More quality enables you to more accurately preview what your audiences will see when they view your products, be they static graphics, animations or movies. Any colour concerns that you may have tend to be more about matching one onscreen object or scene with the shades of another. Such determinations are generally made visually, rather than technologically.

We were pleased to see that the minimum warranty offered by any of the panels is three years, while the Eizo comes with an investment-protecting five-year warranty. This is an example of the way that behind-the-scenes technological advances (in this case, more reliable construction and more durable backlights) improve the front-end user experience. When you consider that warranties have tripled over the past few years, it makes it easier to execute a departmental upgrade to big screens. Limited warranties are no longer a major prohibitive factor.

To some extent, our decision about which monitor was better than another was based on our feelings towards each model as we used it. They all felt good – the Sony was stylish with appealing controls, the Eizo was plain yet easy to operate. Ironically, the BenQ felt the worst because it seemed quite unstable on its little base, yet it was connected to a somewhat bulky plinth.

However, we also had to consider how you were going to use the monitor and rated each feature accordingly.

Connectivity is an important feature, and they all provided dual computer connectivity, though strangely, the ViewSonic only provided a single digital connector. If you want to connect to a second PC with that one, you have to do so with a lower-quality analogue interface. It was here that the BenQ model distinguished itself, with the option to connect video sources via a composite or SVHS connector. This means that you can use the display as a reference monitor when authoring video.

Only two models offered picture-in-picture, which enables you to see a second video source in a smaller window on the main display, and again, the BenQ was one of them. This feature was made all the more useful by the panel's connectivity options.

While all of the models were excellent, the BenQ just managed to nudge ahead of the competition in a few areas that provided greater versatility. However, if portrait mode is important to you (and you have a supported graphics card), you may prefer the Eizo or ViewSonic models. ●

FEATURES

MODEL	VIEWABLE AREA	NATIVE RESOLUTION	DOT PITCH	COLOUR DEPTH PER CHANNEL	VIEWING ANGLE (BOTH AXES)	CONTRAST RATIO	BRIGHTNESS	RESPONSE TIME	TCO COMPLIANCE	WARRANTY	CONNECTORS	PRICE	SCORE
Sony SDM-P234	23in	1,920x1,200	258mm	16.7	170 degrees	400:1	250cd/m ²	16ms	'99	3 years	2x VGA, DVI-D	£1,070 excluding VAT	7
BENQ FP231W	23in	1,920x1,200	258mm	16.7	176 degrees	500:1	250cd/m ²	16ms	'03	3 years	VGA, DVI-D, S-Video, Composite	£1,020 excluding VAT	9
ViewSonic VP231wb	23in	1,920x1,200	250mm	16.7	176 degrees	500:1	250cd/m ²	16ms	'99	3 years	VGA, DVI-I	£1,020 excluding VAT	7
NEC LCD2180UX	21in	1,600x1,200	270mm	16.7	176 degrees	500:1	250cd/m ²	20ms	'99 / '03	3 years	DVI-I, DVI-D, VGA	£799 excluding VAT	7
Eizo L997	21.3in	1,600x1,200	270mm	16.7	170 degrees	550:1	250cd/m ²	30ms	'99 / '03	5 years	2x DVI-I, VGA	£829 excluding VAT	8



DETAILS

PRICE

- *Maya Unlimited 7*
£4,899 / \$6,999 / €7,349
- *Maya Complete 7*
£1,449 / \$1,999 / €2,099
(excluding VAT)

PLATFORM

PC / Mac / Linux

MINIMUM SYSTEM

PC

- Windows 2000 / XP
- Pentium III or AMD Athlon processor
- 512MB RAM

Mac

- OS X 10.3.5
- Power Mac G4 / G5
- 512MB RAM

Linux

- Red Hat Linux 9, Red Hat Enterprise Linux 3 WS, SUSE Linux 9.1
- Opteron (32-bit mode) Athlon (32-bit mode)
- 512MB RAM

MAIN FEATURES

- Improved character workflow tools
- Polygon enhancements
- Improved integration
- Support for ASHLI shaders

DEVELOPER

Alias

WEBSITE

www.alias.com

Maya 7

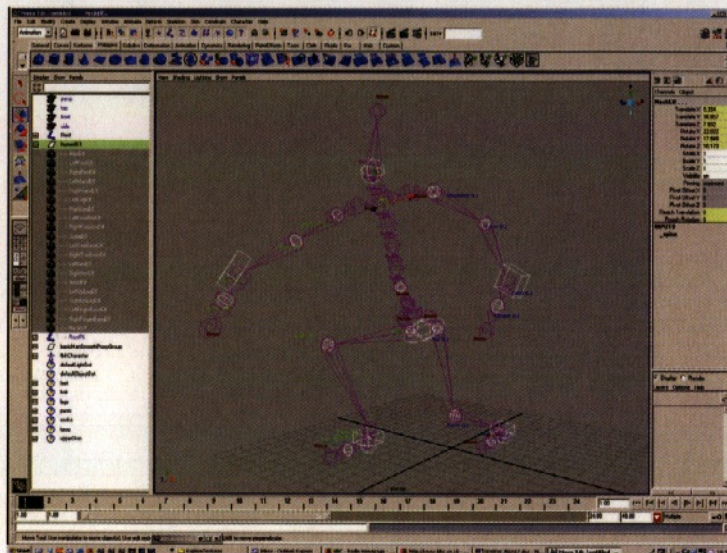
After the rather disappointing Maya 6.5, is Maya 7 as worthy of our hard-earned money as Alias would like us to think? Well actually, it is

BY GARY NODEN

Not too long ago, we reviewed *Maya 6.5*, Alias' animation software used by games, television and film companies across the world, but you needed a diamond-tipped shovel to dig anything wonderful out of it. Alias users began ranting: "We want more games improvements, better all-round integration and, oh yeah, what about that *MotionBuilder* thingy you guys bought? When are we going to see some of that?" So, was Alias listening?

On opening *Maya 7* you notice changes immediately, specifically a compass in the right-hand corner of the Perspective view. Our first thoughts were along the lines of 'nice gimmick, but where's the meat?' but it soon became apparent from clicking on the compass that this gimmick was actually an ultra-fast way of changing Perspective view into an orthographic camera centred on your point of interest. The upshot is that using one window instead of four speeds up your modelling and animation workflow immensely.

There's also a new universal manipulator that enables you to translate, rotate and scale at the same time, but by the same token it doesn't work in Component mode,



It's a bit difficult to make out when it's static, but this is a full IK skeleton. You've got to try this in *Maya 7* to really appreciate how impressive it actually is

which seems a bit of an oversight when this is where it would be of most use.

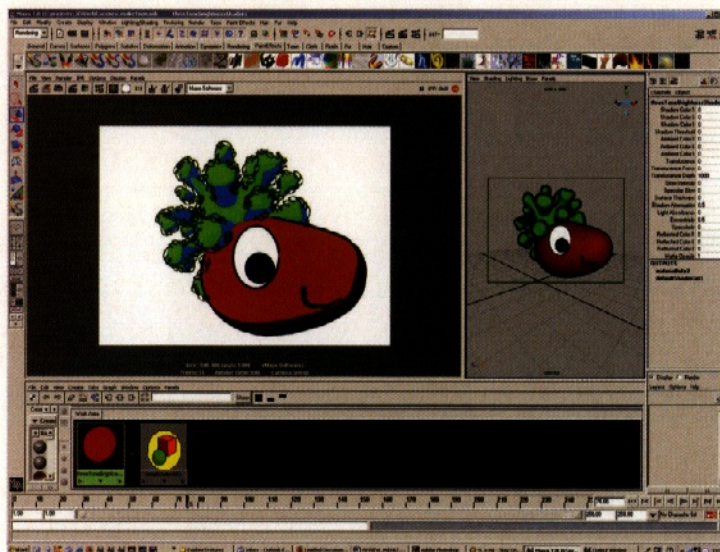
There are also major changes in the Polygon toolset, which boasts several new primitives including a helix, a pipe and a soccer ball. You can also now step through your vertices using the arrow keys, just as you can with CVs. You can select and create

edge rings; they were only an *MJPolyTools* MEL script away before, but having them as part of the toolset means they're all under marker menus, which make things quicker.

And, at last, fonts are fully supported. You can now create bevelled text that can be updated, and use Adobe *Illustrator* files much in the same way, allowing you to edit them in *Illustrator* and have them update in *Maya*. This is handy for text and surprisingly useful as a curve-building tool for modelling.

BAKING-HOT UPGRADE

So, *Maya 7* now seems capable of doing everything its competitors have been able to do for years, but is that all? Oh no. If *Maya 6.5* was a tune-up, *Maya 7* has the



Maya 7's new Toon Shader is quick to get to grips with and implement, but very slow in the interface. Thankfully, it manages to render relatively quickly



The new Surface Sampling tool means that just about anyone can now build low-polygon, games-style guns. Meet my Boomstick!

RELATED PRODUCTS

- *3ds Max 7.5*
Reviewed: Issue 66
- *Cinema 4D 9*
Reviewed: Issue 58
- *LightWave 3D 8*
Reviewed: Issue 53
- *Softimage XSI 5*
Reviewed: Issue 70

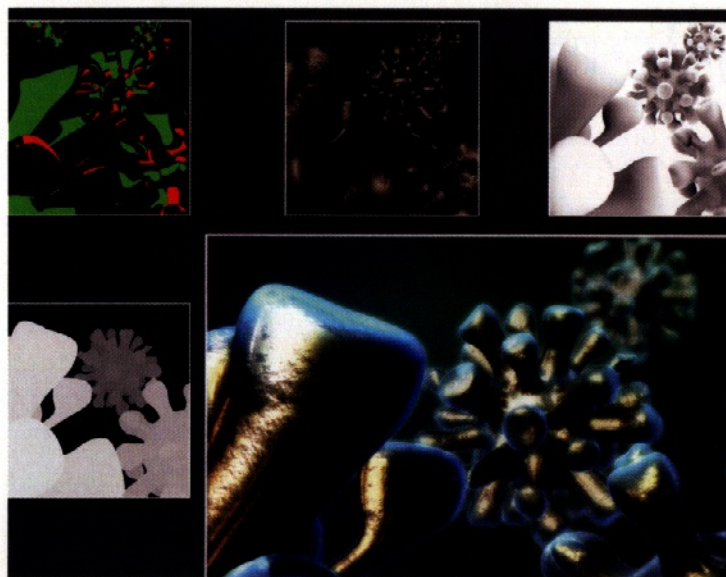


same team ripping out a spluttering 1.4 litre engine and sticking in a 4.1 litre V8. Here are some of the reasons why.

Every character modeller has had a horrible moment when, having created almost all of the character's blendshapes, they realise they need about 40 more vertices to get the facial expressions right, and consequently flush a day's work down the pan. Well, not any longer, thanks to Bake Topology to Targets. This feature means you can add vertices, faces and edges to your base model and then add these changes to all of your targets at the click of a button. It's the type of wonderful tool that you never thought you would see, and coupled with the ability to paint blendshape weights, it makes for the beginning of some very powerful changes.

Another incredible new feature is the Geometry Replacement tool. This enables you to edit a copy of your rigged polygon character and then just swap it for the one that's bound with the weights, making educated guesses as to where the new points should be bound.

MotionBuilder's full IK set-up is integrated into the Joints toolset and can be applied to a biped or quadruped at the click



● The new Render Layers toolset is a true masterstroke from Alias, allowing for simple animation changes and never compromising your rendering pipeline

menu, you get the feeling that the majority of improvements seem to centre around the games industry. According to Alana Challis, a technical artist at Sony Computer Entertainment Europe, this isn't surprising: "The imminent arrival of the next generation of games consoles has forced

shader opacity to the render engine used. The Toon Shader, available under a separate rendering menu, allows the quick application of ramp shaders, plus a nifty Paint Effects-created 'toon' edge that can also be given preset qualities. All of these, and more improvements, are in *Maya Complete*. If you have *Maya Unlimited*, you can now control Fur with Hair dynamics, rather than rely on tiny attractors, and you can lift hair from one object and transfer it to another. Other improvements exist in the Cloth and Live toolset, but nothing as comprehensive as the changes in *Maya Complete*.

MAKING A COMEBACK

This is a great release, geared at helping Alias win the applications war in the games market. *Maya 7* has elevated the company's profile above a lot of its competition – something this program hasn't done for some time. *Maya 6.5's* release was poorly received by users, but with *Maya 7*, Alias has given all of its users, be they in games, TV or film, a program to be proud of. ●

IF MAYA 6.5 WAS A TUNE-UP, MAYA 7 HAS THE SAME TEAM RIP OUT A 1.4L ENGINE TO STICK IN A 4.1L V8

of a switch. You can create an integrated ground plane for all of the characters' limbs too, which is just too beautiful to describe.

And Normal Mapping couldn't be easier, thanks to the Surface Sampling tool. Fit a low-polygon object over multiple high-resolution ones and it creates displacement, colour and normal maps automatically.

With the ASHLI shading language and the *CgFX* plug-in (both used for games shaders) totally integrated into *Maya 7*, plus better UV texture tools with their own

Maya 7 to address the needs of the games industry. Next-gen artists want shaders, normal maps and edge loops, and if they couldn't get them from *Maya*, they would start looking elsewhere."

But it's not all about gaming. TV and film users will be pleased to note that the render tools are vastly improved, thanks to new render layers and the new Toon Shader. The render layers now enable you to put all of your objects into each layer, making use of layer-specific presets that range from



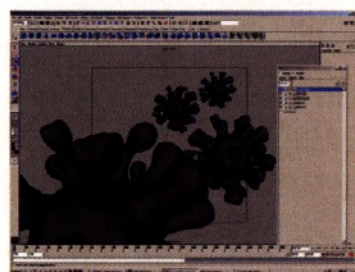
● Forget Attractors for Fur – this head has Hair's dynamic curves as goals for the fur, making for realistic motion and collisions



● This fur, later in the scene, has taken on the same motion as the dynamic curves, which are not intersecting with the geometry



● At last, *Maya 7* supports fonts. Bevelled text can now be changed by retyping the text or changing the font in the Attribute Editor



● Render Layers in *Maya 7* finally do what they should. You can apply layer presets such as Diffuse or Specular to your objects, too



● Your client tells you a character needs horns! Rather than kill the client, you can make the changes and propagate them to your blends



● Your blends now have the history of your base object built into their topology, enabling you to be devilishly quick with adjustments

VERDICT

PROS

- Significant polygon updates
- Powerful Toon Shader
- Improved software integration
- Games-oriented update

CONS

- A bit late

RANGE OF FEATURES

9

VALUE FOR MONEY

9

OVERALL

9



RenderMan for Maya

Pixar unleashes a fully integrated renderer for Maya, priced at just \$995. But does this new plug-in tick more boxes than mental ray?

BY GARY NODEN

DETAILS

PRICE

• £550* / \$995 / €806*

*Currency conversion (excluding VAT)

PLATFORM

PC / Mac

MINIMUM SYSTEM

PC

- Windows XP
- Maya 6.0.1 or Maya 6.5

Mac

- Mac OS X
- Maya 6.0.1 or Maya 6.5

MAIN FEATURES

- Support for Maya's particles
- Integration with Maya Fur and Hair
- Subsurface scattering on any shader
- Blur reflections and refractions on any shaders

DEVELOPER

Pixar

WEBSITE

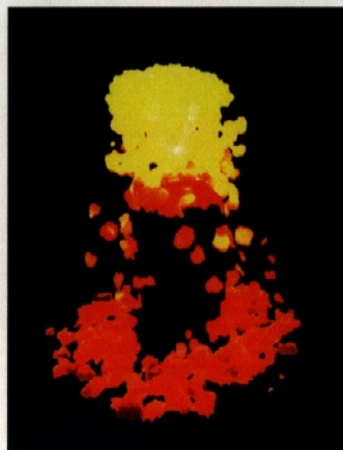
<https://renderman.pixar.com>



RenderMan for Maya (or *RfM*) is quite simply what it says on the box: an implementation of the award-winning renderer from Pixar that runs inside the *Maya* architecture in much the same way that *mental ray* does. Unlike *RenderMan Pro Server* and *RAT*, which together cost about \$5,500, *RfM* costs only \$995. But where are its limits? What do we get for our dough?

You've seen *The Incredibles* – you know what this renderer can do. But with a much better integrated version of *mental ray* on *Maya 7*, do the middle-level production houses this package is aimed at really need to buy it?

When it comes to both looks and performance, *RfM* punches out *mental ray*'s lights. Here's one example of why: you've created a shader in *Maya* using a Blinn and it's perfect in every way, but now you want a soft reflection. In *mental ray*, you have to go through the whole process of creating a phenomenon shader that combines the qualities you have with a *mental ray* DGS shader. In *RfM*, you open up the attribute editor of your Blinn, add the *RenderMan* Reflection Controls and then turn up the Reflection Blur. Nice and quick. The same 'Add *RenderMan* Attribute' process controls refractions and subsurface scattering, which seems to work very quickly. In fact, every render tool is quick. Global Illumination is turned on at the click of a button (as in *mental ray*), but any similarity ends there. In



● Particle spheres, using rgbPP values in their incandescence, displaced by a fractal and motion blurring. You can't do all that in *Maya*

our time tests, *RenderMan* was between three and 10 times faster than *mental ray*, depending on render quality.

A ROCKING RENDERER

RfM supports Fur, Hair, subdivision surfaces (except creases), almost every shader, every light source and some Paint Effects features. But in our effects-based opinion, where it really rocks is with particles. *RenderMan* loves them more than *Maya*. *RfM* supports almost every type of particle in its renderer, and it also supports Particle rules such as rgbPP and opacityPP. And, of course, these also support Deep Shadows. This is a unique shadow mapping technique that holds colour transparency information



● The *RenderMan* displacement is wonderful up close, as the renderer automatically softens pixels to avoid jagged edges

and can be filtered to create accurate hair shadows. Oh yes, and they motion-blur.

If *RfM* were a pie, it would have a diamond crust, but with a tiny hole in it. *RfM* only runs on one processor, period. One licence of *Maya* can multi-thread on 9,999 other machines, while *mental ray* (as of *Maya 6.5*) has a limited option to multi-thread its renders. *RfM* has no such option. If you want it, you'll have to buy *Pro Server* and *RAT*. Saying this, it integrates so well into *Maya*, it quickly renders beautiful CGI – and at \$995, a licence or two wouldn't break the budget of any small studio. Stunning and fairly inexpensive, *RenderMan for Maya* is a must-have plug-in for any 3D company. ●



● GI, occlusion, HDRI lighting, soft reflections on default settings. How long did it take? Just under four minutes at 1,024x1,024



● The same scene, but rendered by *mental ray* (also on default settings). Better, possibly, but this took almost 42 minutes to render

RELATED PRODUCTS

• Turtle
Reviewed: Issue 55

VERDICT

PROS

- Total integration
- High-speed renderer

CONS

- Single-thread only
- Not upgradeable to *MTOR*

RANGE OF FEATURES
VALUE FOR MONEY
OVERALL

10
8
9

LEADING FACIAL ANIMATION TECHNOLOGY AT THE CUTTING EDGE!

LIFE STUDIO: **HEAD** 2.7

Facial Animation

NEW! Animate using AVI as a background

Realistic texturing

NEW! Take photos and get texture

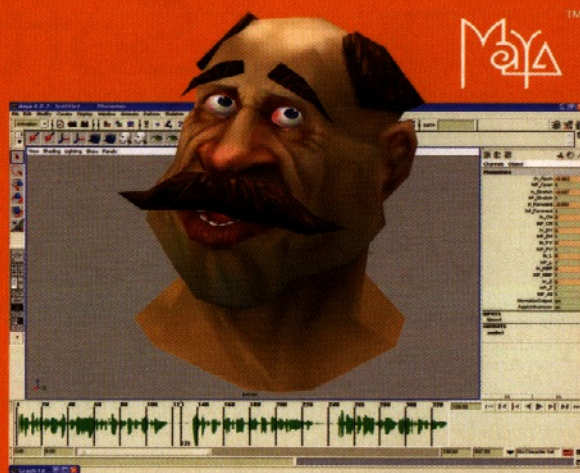
Automated lip-synch

Easy modeling

Export-import from 3ds max or Maya

LifeStudio: Head 2.7 SDK
supports "PlayStation®2",
Xbox® and Windows® PC

Educational license of LifeStudio:Head is now available!



**NEW LIP-SYNCH PLUG-IN
FOR MAYA USERS IS COMING SOON!**



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THE Type ISSUE



**HOW TO: DESIGN YOUR OWN TYPEFACE • CREATE A WILD
SYMBOL FONT • PROMOTE AND SELL YOUR FONTS • MAKE WEB
TYPE WORK FOR YOU • PLUS 40 FREE PROFESSIONAL FONTS**

**ISSUE 76
ON SALE
THU 15 SEPT**



DETAILS

PRICE

- Advanced £3,950 / \$6,995 / €5,824*
- Essentials £1,125 / \$1,995 / €1,659*
- Foundation £299 / \$495 / €441*

*Currency conversion

PLATFORM

PC / Linux

MINIMUM SYSTEM

PC

- Windows XP Professional SP2 / x64 Edition
- K7 or Pentium III processor
- 256MB RAM
- Linux
- Red Hat Enterprise Linux 4, kernel 2.6.9
- Fedora Project Core 3, kernel 2.6.9-1.667smp
- Novell SUSE LINUX 9.3
- Default GNOME window manager, or KDE

MAIN FEATURES

- Gigapolygon Core
- Ageia NovodeX physics simulation engine
- Shape Manager
- Ultimapper
- Bezier curves

DEVELOPER

Softimage

WEBSITE

www.softimage.com

RELATED PRODUCTS

- LightWave 3D 8
Reviewed: Issue 53
- 3ds Max 7.5
Reviewed: Issue 66
- Maya 7
Reviewed: This Issue

Softimage XSI 5

Not quite the hefty new features list we've grown used to, but is there more to this latest release than meets the eye?

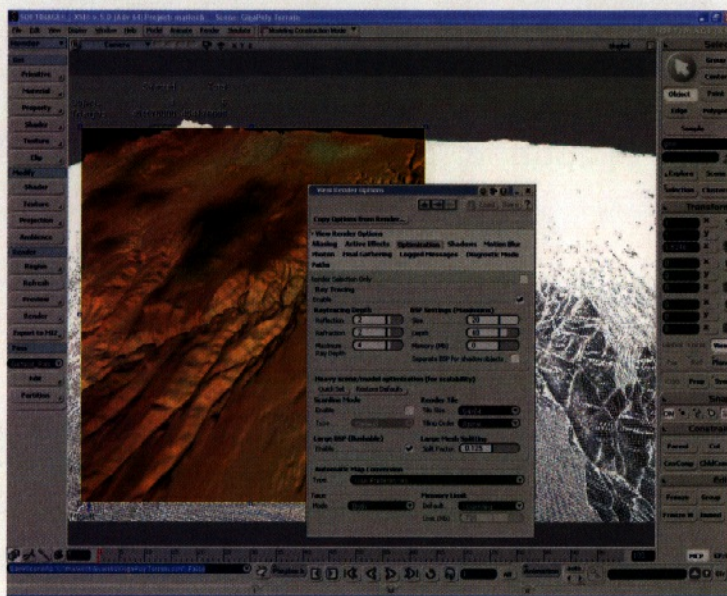
BY OLA MADSEN



One of the first things that strikes you as you go through the new features list of Softimage's latest release of XSI is that it's almost 'small' enough for you to actually be able to browse through.

Over the years, the *Softimage XSI* user base has been spoiled enough to grow accustomed to a weighty 'new features manual', and having brand new tools added to almost every part of the program, whereas this release feels slightly below par. But don't be fooled...

Once you start scratching beneath the surface, it becomes obvious that the Softimage camp hasn't been lounging idly about. In addition to adding several functions that have been on the wish list since the early days, the main two characteristics to stand out in the latest release are the major enhancements made to scalability and workflow. Because modern productions are getting larger and more complex, it has become vital for 3D applications to be able to handle huge amounts of information. With *XSI 5*, we're introduced to the gigapolygon core architecture – a technology that enables



• XSI's new gigapolygon core architecture allows you to handle truly ridiculous amounts of data, and adds weight to the proclamation, 'If you can load it, you can render it'!

you to handle ridiculous amounts of data in terms of models, polygons and textures. Put into context, *XSI 5* was, for example, able to run a scene with a billion polygons on a 32-bit laptop with 1GB of RAM, and you'd even be able to render it. The new mantra

for XSI is: 'If you can load it, you can render it'. In addition, XSI is available in 64-bit, which overcomes previous limitations of the 32-bit systems (such as memory handling), and will raise the bar even further.

Another truly exciting feature is the Generalized Attribute Transfer Operator, or 'Gator'. This operator enables you to transfer any surface attribute from one object to another, regardless of the polygon count, topology or even if there's any animation applied to the objects. Even shape animation, weights and UVs can be transferred within a few clicks. This actually gives you the option to do things such as model your own texture projection as an



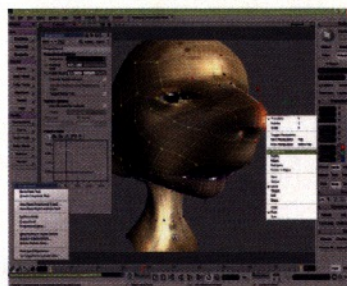
• Using the Shape Manager, you can easily create, modify and animate all your shape animation within the dedicated UI, however strange your projects may look!



• In addition to a comprehensive Maya-like interaction preset, the [Alt] key camera navigation, XSI now supports tear-off menus



● XSI 5 ships with the latest version of *mental ray*, which also features native shaders for subsurface scattering and ambient occlusion



● The new 'Tweak Component Tool' enables you to scale, rotate and translate points, edges and polygons all in one go

alternative to relying on what's built in. This can be a priceless tool to have when getting to the late stages of production.

Although Rigid Body Dynamics found its way in to XSI as one of the 'hero' features in version four, the entire engine is already replaced. Version five now features the state of the art Ageia NovodeX physics simulation engine, claimed to be up to 100 times faster than the Open Dynamics Engine in the previous release.

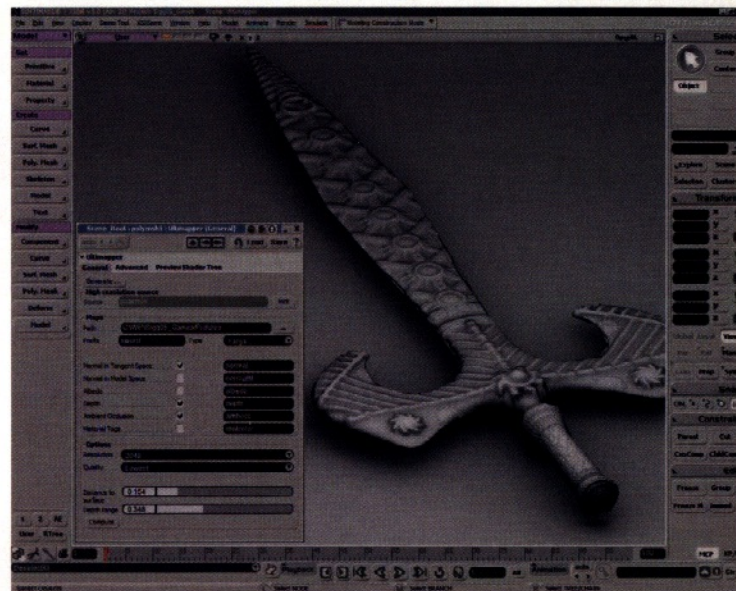
COFFEE BREAK

In addition to the speed increase, two new collision types have been added: 'convex hull', which can be described as a budget version of the object's actual shape, and a brand new definition of the 'actual shape'. The latter also enables you to specify any of four levels of detail to be used in the calculation, ranging from 'Low' (for fast calculation) to the ultimate resolution 'Coffee break' (self-explanatory). Perhaps more important is the improved scalability

and accuracy offered by the new engine. Another new feature in the simulation department is that you can finally use geometry as hair instances. Hair can now be brushed and styled with proportional modelling, and any type of geometry can be used, including multiple objects. With all the traditional styling tools still available, the hair operator's field of application has become wider.

Other sought-after features include the facility to display and edit keyframes directly on the timeline, native subsurface scattering and ambient occlusion shaders, geometry displacement using texture maps and, while it's hard to believe, *Softimage XSI 5* finally features Bezier Curves. As if that isn't enough, you now also have the option to automatically generate UVs when creating a mesh from the curves.

While the popular Normal mapping has been possible for some time in XSI, the new Ultimapper tool automates the entire process and takes it a step further. Normal,



● The Ultimapper generates far more than traditional 'Normal' maps and can be used with any of XSI's rendering engines: OpenGL, DirectX and *mental ray*

depth, albedo, light and ambient occlusion maps can now be generated and previewed with any of XSI's rendering engines (OpenGL, DirectX, as well as *mental ray*). As all the maps are generated by *mental ray*, quality is ensured, even at high resolution.

People who've found shape animation complicated in the past will be pleased to see the new Shape Manager. Shapes can now easily be created, modified and animated all in the same place, without even thinking about building your shape library in advance. It's good to see Softimage taking the time to review the



● With the new Ageia NovodeX engine, XSI's rigid body dynamics has taken a huge step forward in terms of accuracy and scalability

MORE THAN THE SUM OF ITS PARTS, VERSION 5 ADDS REAL QUALITY AND COMPLEXITY TO XSI

current toolset as well. You'll find several areas where the actual core functionality isn't so different from what was found in the previous release, yet it's the way these 'new features' have been implemented that will make all the difference. Add to this their seamless integration and you'll get the added depth of the sum being greater than the parts. Though the new feature-set in version five may not be the largest in XSI history, it may yet be the most prominent release due to the complexity and quality it adds. Softimage has evolved incredibly since XSI took its first faltering steps, and it's turning into the next-gen, non-linear, rock-solid package we've always wanted. ●

VERDICT

PROS

- Handles huge amounts of data
- Ageia NovodeX physics
- CONS
- Particles still not updated
- Few procedural shaders

RANGE OF FEATURES

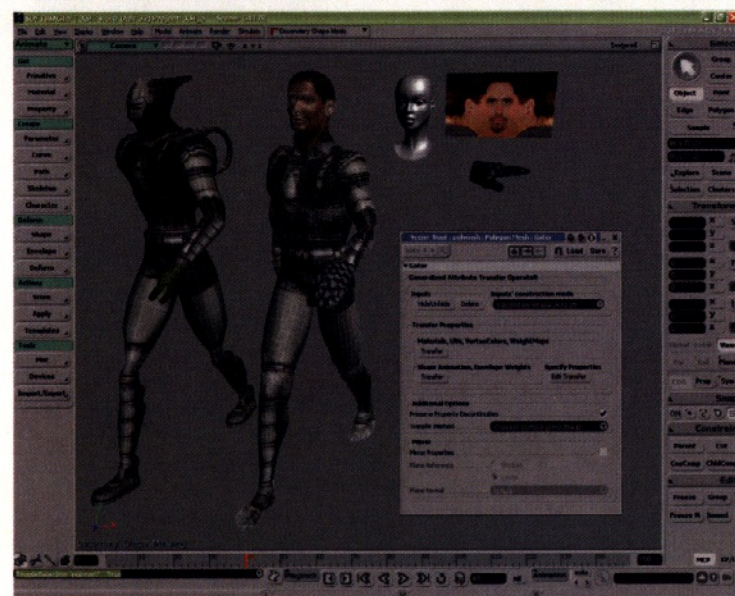
8

VALUE FOR MONEY

9

OVERALL

9



● Why not model your own texture projection? Gator enables you to transfer any surface attributes from one object to another, including UVs, weights, shape animation and more

Image courtesy of Avid Technology Inc.



DETAILS

PRICE

- £514* / \$895 / €737*
- Upgrades £217* / \$379 / €312*

*Currency conversion (excluding VAT)

PLATFORM

PC / Mac

MINIMUM SYSTEM

PC

- Windows 2000 / XP
- 500MHz processor
- 256MB RAM

Mac

- Mac OS 9 or OS X
- 300MHz G3 or G4 processor
- 256MB RAM

MAIN FEATURES

- Easy to learn and use
- Efficient use of hardware
- Fast rendering
- Network rendering included

DEVELOPER

EI Technology Group

WEBSITE

www.eitechnologygroup.com

EIAS 6

It's stable, easy to use, and includes a set of well-planned enhancements. But can the latest version of EIAS continue to compete at its current price? **BY LANCE EVANS**



EIAS is a 16-year-old animation package that has long been a workhorse in the film and broadcast

graphics industries all over the world. The developer, EI Technology Group, is a relatively small company in an industry that's increasingly difficult for small companies to operate within. How has EIAS survived? By offering features that are hard to find elsewhere in a package that's generally easy to use, efficient, and supported by a dedicated user base.

So, what's new in this latest version?

Smart developers sporadically take the time to work on the system, rather than just the features, and in this instance – instead of forcing a whole new interface on its users – EI has offered a good range of specific refinements that make the entire workflow move along faster and more efficiently. Viewed as a whole, we see a developer trying to narrow the gap between itself and some of its competitors. It succeeds in places, fails in others.

QUICK RESPONSES

The single best improvement in version 6 of EIAS is a much faster implementation of OpenGL, which we've had reason to complain about in previous reviews [EIAS



● EIAS chomps through loading and rendering heavy data-set scenes, like this architectural image by Edinburgh's CGI Media. It also manages to do equally well with large-scale image maps

5.5, issue 59). EIAS 6's OGL response is many times faster than 5.5 and is now quite acceptable. It even supports the display of transparencies and allows lighting sets to control what the OGL uses for illumination.

There is a catch, however: EIAS defaults to a classic four-window interface (three projections and a perspective camera view). Asking the system to update four windows at a time is taxing, even when some are set to wireframe mode. This is the reason why

many other 3D programs moved to a single-window format years ago.

EIAS can be set to use a single-view window as well, but this must be done manually. And while the projection views can be interactively swapped using simple keyboard commands, the camera view isn't invited to that 'swap-meet'. Additionally, important tool windows still don't float over the view windows and are forever getting lost underneath. These problems create some real workflow issues, to which the only real solution is more screen real estate (preferably a second monitor).

This version also adds contextual menus for the right mouse button. As you right-click on different elements, a logical assortment of options appear. Some options are those that would otherwise be buried deep in the interface and therefore harder to get at. Though not user-definable, this is a welcome addition.

Good user interfaces often come down to the little things. For us, it's the addition of [F5] and [F8] hotkeys that kick off 'render window size' and 'render full size' commands respectively. This makes test rendering much easier and faster.

There are a host of refinements for the animating process as well. Keyframes can now be dropped into the timeline with a simple right mouse button click on any



Image © Agemi & Moran

● Atmospheric and other inspired optical effects have been added to this version – and previous recent upgrades – of EIAS, significantly expanding its visual capabilities

RELATED PRODUCTS

- Cinema 4D 9
Reviewed: Issue 58
- Softimage XSI 5
Reviewed: This issue

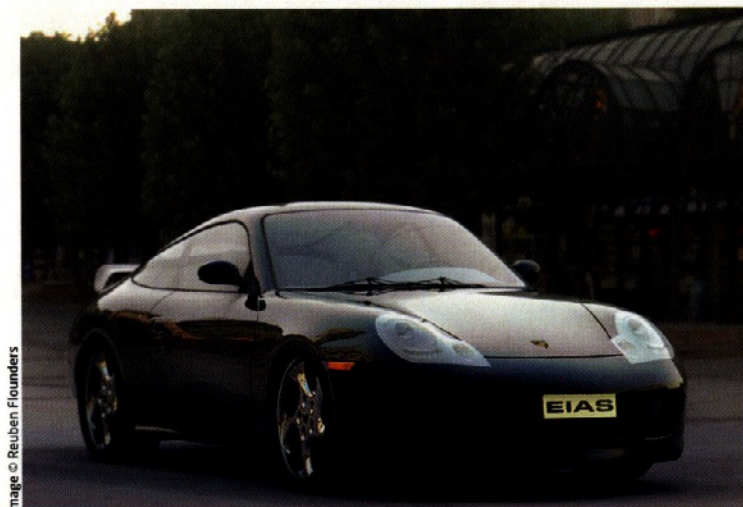


Image © Reuben Founders

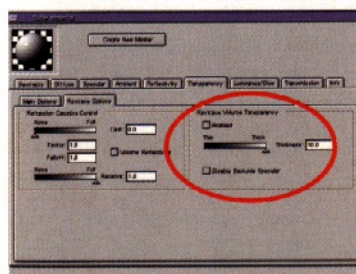
● With radiosity, fast faux GI, powerful match move and camera mapping capabilities, *EIAS* can successfully integrate photorealistic CG images with film work

purple control bar in the Project window. The beauty of this is that keyframes can easily be added to times other than the current time. This can speed up many tasks and isn't found in some other programs.

Another important refinement is the ability to select any number of keyframes of a motion path (by marqueeing them in the Project window), and drag them interactively in the view windows as a single unit. Previously, only the current time's keyframes could be dragged.

Many other enhancements will make for happier animators as they're learned and incorporated into workflows. Some will affect all users, while others (such as the ability to use a comma as a decimal point) will only affect certain groups. The scripting plug-in, *Xpressionist*, has also been updated to offer some new real-time capabilities.

New rendering enhancements include Raytrace Volume Transparency, Fresnel effects, subsurface scattering, and a Shadow Mode Only option for faster, soft raytrace shadows. Be aware that raytracing tricks are great, but they severely chip away at even *EIAS*' legendary rendering speed. A long-standing displacement mapping bug has also been resolved.



● Note *EIAS* 6's new Raytrace Volume Transparency and Disable Backside Specular options in the Transparency submenu

These small fixes all add up to a particularly good upgrade. The result is a stable product with enhanced productivity and a more enjoyable interface. If you're a current owner of any version of *EIAS*, our advice is to go ahead and buy version 6, which is probably its best upgrade in years.

VALUE FOR MONEY?

But the bigger questions are: how does *EIAS* fare at the full purchase price? And how does it compare with other programs on the market? Without its own built-in modeller, dynamics, UV map controls, texture baking, FBX (though promised soon), or GI (again, promised soon), and a woefully limited particle system, it may be hard to lure over users of other programs.

EIAS now bundles *Silo* 1.4 along with new sales. *Silo* is a great new modeller, but may not yet compare to the more developed and integrated modellers offered in many animation packages. If more modelling muscle is needed, the total cost of ownership goes up. Price-wise, keep an eye out for the entry-level offerings from *Cinema 4D* and *Softimage XSI* (PC). Both are at least \$200 below *EIAS* and provide upgrade paths to more powerful versions.



● *EIAS* offers a full complement of CA tools that should satisfy all but full-time character animators. Image by Mike Fitzgerald/3dartz



Illustration © Lance Evans

● Complex commercial animations like this one, with heavy polygon counts, are handled with aplomb by *EIAS*, and rendered with amazing speed. Image produced with the Phong renderer

Price comparisons aside, *EIAS* continues to be a strong offering for those who need scenes with super-high polygon counts (most of us, but especially architects) and super-fast rendering. *EIAS* also includes

THE BEST UPGRADE IN YEARS, BUT IT MAY BE HARD FOR EIAS TO LURE IN USERS OF OTHER APPS

Renderama – a wonderful network rendering application with unlimited render nodes for Mac OS and Windows. No Linux/Unix support for *Renderama* unfortunately keeps most large render farms out of reach.

With its current price and feature-set, *EIAS* may not tempt artists to switch their main application. However, if the developer continues to build on the program's unique capabilities, it could become a great specialist application for heavy-lifting in rendering and effects work – and a versatile addition to any shop's existing toolbox. ●

VERDICT

PROS

- Interface modernised
- Faster OpenGL
- Industrial strength/stable

CONS

- Lagging interface problems
- Missing features
- Still seems pricey

RANGE OF FEATURES	7
VALUE FOR MONEY	7
OVERALL	7

SketchUp 5

@Last builds on its success with this new release of its architectural modelling software, which includes some very useful new features

BY CHARLES MORGAN

DETAILS

PRICE
£315 / \$570* / €462*
*Currency conversion
(excluding VAT)

PLATFORM
PC / Mac

MINIMUM SYSTEM
PC
• Windows NT4 / 2000 / XP
• 600MHz Pentium III
processor
• 128MB RAM
Mac
• Mac OS X 10.3
• 400MHz G4 processor
• 128MB RAM

MAIN FEATURES
• Unique modelling
approach
• Non-photorealistic output
• New Sandbox terrain
modelling
• New Component Outliner
• Ruby script extensions

DEVELOPER
@Last Software

WEBSITE
www.sketchup.com



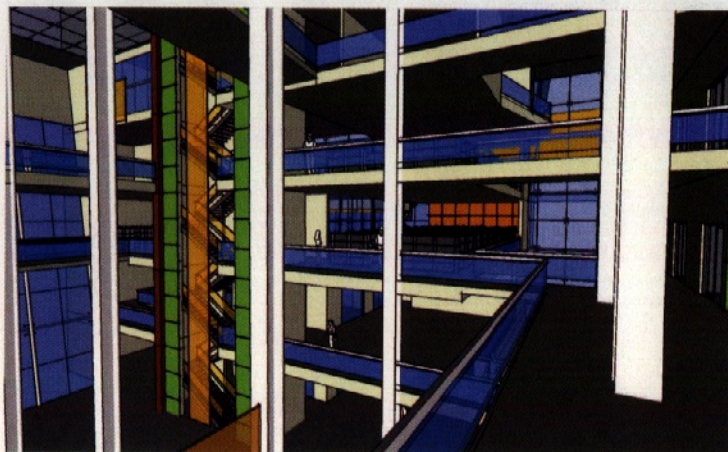
With the new release of *SketchUp 5*, @Last has strengthened its unique approach to modelling by

providing you with a couple of solid reasons to upgrade. The improvements range from increased performance to new management tools, and even a terrain modeller.

SketchUp's main draw is its ability to create accurate, quick 3D models in an intuitive way. There's very little out there in the software world that can compete with this program's workflow, which is based on the 'push-pull' function. Drawing lines on surfaces in *SketchUp* subdivides the geometry automatically, allowing the user to push-pull (extrude) the surface to a desired length in real-time. This feature, used with *SketchUp's* excellent Snap tools, creates some of the best 3D modelling currently available. If you haven't tried any of the *SketchUp* versions, do yourself a favour and download the eight-hour demo – it's a refreshing approach to 3D modelling.

One of the best new features in version 5 is the Sandbox toolset, which can create 3D terrain from existing contours or from scratch. Many of *SketchUp's* existing users utilise the software for architectural visualisations. By importing an *AutoCAD* drawing with contours, you select its lines using the Make From Contour tool, then *SketchUp* creates a triangulated mesh from the contour lines. From this point, the mesh can be edited using the Smooove tool (a combination of Move and Smooth tools), the Stamp tool and the Drape tool. Additional detail can be added with the Add Detail tool.

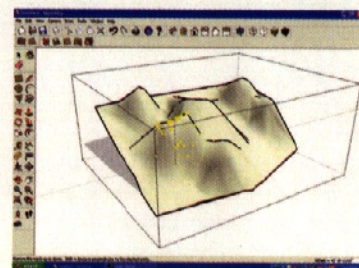
@Last has also added a Component Outliner, similar to any layer manager found



● *SketchUp* can be used to create impressive-looking models with precision and speed. Its 'sketchy' feel is backed up by one of the best toolsets in the business

in other applications. Creating groups and components is the best way to keep geometry from blending into one lump of 3D goodness, and maintains your sanity in the process. The Outliner in this new version finally provides a way to organise and edit the hierarchy of objects. Clicking on a group or component in the Outliner automatically selects that item, separating it from anything else in the scene and preparing it for editing. If the group or component has other objects within it, the Outliner expands and lists them; with earlier versions of *SketchUp*, you would have to go on a double-clicking frenzy in the viewport.

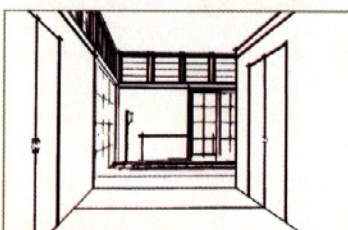
The speed of *SketchUp* has been substantially increased. @Last claims that it's twice as fast as usual during certain operations, and this seems accurate. On the downside, the software is still unable to take advantage of Hyper-Threading or multiple processors. This can be annoying when frame rates dip to single digits and



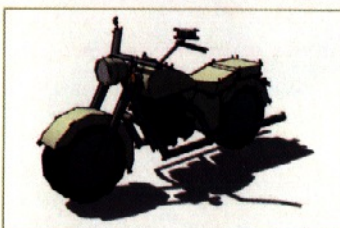
● An example of *SketchUp's* terrain modelling. Once you create a mesh, the Smooove tool allows for quick contour changes

SketchUp is using only half or a quarter of its available resources. The same is true when exporting images or animations, which increases wait times for the user.

SketchUp also lacks the ability to add any type of lighting other than shadows. Hopefully, the next version will contain standard lights, similar to most 3D programs. The 3DS exporter is much improved, but some *SketchUp* users won't have access to high-end 3D applications for lighting. ●



● *SketchUp* enables you to modify the line characteristics, viewed in real-time. Here, the Jitter and Extend Lines options are revealed



● This is a component included in *SketchUp 5* with the shadows turned on. Usefully, shadows can be generated in real-time

VERDICT

PROS

- Intuitive, fun modelling
- New Sandbox toolset
- New Component Outliner

CONS

- Doesn't use Hyper-Threading
- Still no lights

RANGE OF FEATURES

8

VALUE FOR MONEY

9

OVERALL

8

RELATED PRODUCTS

• Piranesi 4
Reviewed: Issue 61



Artlantis R

One-click radiosity, speed and ease of use at an affordable price – Artlantis R is a step in the right direction for designers and architects

BY JORGE BARRERO

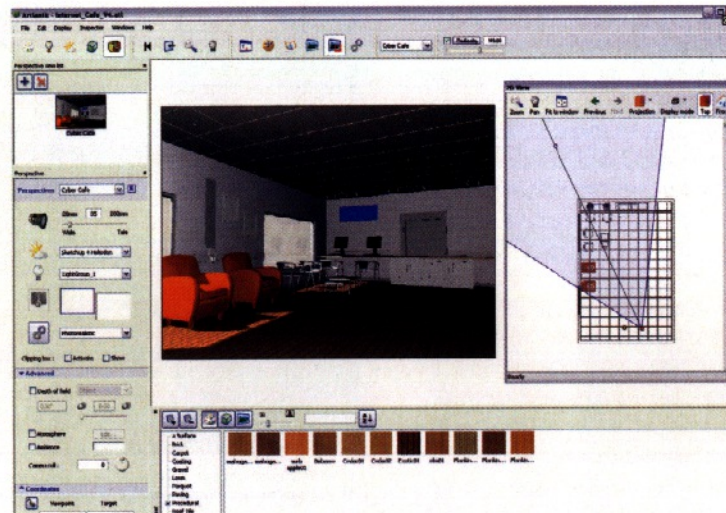


Abvent has released *Artlantis R*, a new rendering program built on *Artlantis*. This new visualisation tool is the first member of the *Artlantis* family of products that will also include *Artlantis Classic* and *Artlantis Studio*. Aimed primarily at the architectural visualisation market, it's best suited to rendering still images for all stages of design. Most popular 2D image formats are supported, including PSD (*Photoshop*) and EPiX (*Piranesi*).

The interface is logically laid out. Dual monitor support and dockable palettes help you to optimise the desktop for maximum productivity. New users will have no trouble in quickly becoming familiar with the controls; lighting, texturing, object and camera controls are grouped together for easy access.

The real-time preview window enables you to set up all aspects of a scene and review changes. The software supports imported model geometry from the most popular 3D formats and CAD packages available, as well as direct plug-in support from modellers such as *SketchUp* and *VectorWorks*. Object placement and handling controls make it easy to manage the composition of your final image.

Shaders and textures are accessed from the Catalog toolbar and applied via drag-and-drop. The program offers basic shader templates and standard textures, and a large library of shaders and objects is available from third-party vendors. The new Postcard feature is the easiest way to exchange all these between scenes.



● In addition to the real-time preview window, *Artlantis R* users can activate the 2D View mode and project their models from above, front, right, left or rear

Artlantis R's lighting system is simple to set up and get to grips with. The sunlight system is physically accurate with adjustment controls for date, time and geographic location. This is supplemented with individual point, spot and parallel lights.

ADDING REALISM

When setting up lights, the real-time preview provides instant visual feedback to your adjustments. The slider controls can be hard to manage, but direct numeric input allows more precision. The perspective or camera set-up enables you to adjust the lens, ambient light and depth-of-field parameters. You can also choose between photographic rendering or NPR (Non-Photorealistic Rendering). One of the most welcome additions in this release

is radiosity rendering. The FastRadiosity technology does a great job of adding realism. It's simple to activate and control, and delivers 'one-click radiosity'. However, while you can achieve great quality with radiosity rendering, there's a limit to the degree of realism that can be achieved due to a lack of advanced radiosity settings.

Artlantis users switching to *Artlantis R* will notice the lack of animation controls. These will become available via *Artlantis Studio*, but some users are bound to feel that something integral to their work is now missing. However, overall, *Artlantis R* has reached a new level of quality and realism over its predecessor. This new tool is a fast visualisation solution for architects, designers and planners that's also good value for money. ●

VERDICT

PROS

- Shallow learning curve
- Fast rendering engine
- Affordable pricing

CONS

- Lack of animation controls
- No multi-processor rendering support

RANGE OF FEATURES	8
VALUE FOR MONEY	9
OVERALL	8



DETAILS

PRICE

- £345 / \$595 / €495
- Special price for *Artlantis* users £205 / \$375 / €300 (excluding VAT)

PLATFORM

PC / Mac

MINIMUM SYSTEM

PC

- Windows XP
- 1.5GHz Pentium 4 processor
- 512MB RAM

Mac

- OS X 10.3
- 1GHz G4 processor
- 512MB RAM

MAIN FEATURES

- Fast real-time scene preview
- Drag-and-drop scene creation
- Simple shader and texture exchange
- Lighting and sun controls
- Perspective camera controls
- Extensive object libraries also available

DEVELOPER

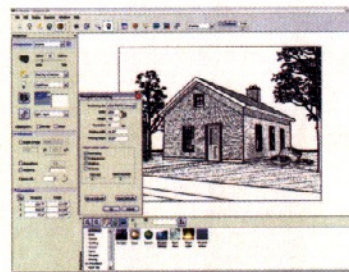
Abvent

WEBSITE

www.abvent.com



● Using simple drag-and-drop, objects can be placed on the scene where desired. You can also adjust their orientation and scale



● Hatch rendering could benefit from additional options and controls, but it's a welcome addition to the toolset

RELATED PRODUCTS

- *SketchUp 5*
Reviewed: This issue, p89
- *Piranesi 4*
Reviewed: Issue 61



DETAILS

PRICE

• £1,495 / \$2,702* /
€2,199*

*Currency conversion
(excluding VAT)

PLATFORM

PC

MINIMUM SYSTEM

• Windows 2000 / XP
• Pentium 4 processor
• 512MB RAM

MAIN FEATURES

- Converts photographs into 3D objects
- Advanced masking tools
- Optimised web output
- Automatic texturing

DEVELOPER

Creative Dimension
Software

WEBSITE

www.3dsom.com

3DSOM Pro

Converting photos into models is a fiddly and time-consuming task, but this handy program aims to simplify and speed up the process

BY MAT BROOMFIELD



Here's another program that creates 3D models by using the silhouette of an object in multiple photographs to

extrapolate its shape.

There are two problems with this. First, in order to provide orientation information, the object to be modelled must be placed within the vicinity of a printed calibration chart. This limits the size of the object that can be modelled. Although *3D Software Object Modeller Pro (3DSOM)* still requires you to print your own calibration mat, it's better than rival package *iModeller 3D* because it will tile the mat across multiple pages up to a maximum size of about seven feet in each axis, enabling you to model objects that size and perhaps twice as large.

The other problem is that many photos must be taken and individually masked in order to indicate what's to be modelled. With complex objects and a minimum of 20 photos, this process can be an arduous task.

AUTOMASKING

It's in this area that *3DSOM Pro* has made the greatest advances over the previous version, and over the competition. The great improvement is the Automask button, which attempts to separate an object from its background. The better your photography and preparation, the more effective this will be. If you use a strong contrasting background and strong, even lighting, your object will be easy to distinguish. However, as the object has to be photographed without a flash, this can be a challenge in itself.

Once you've masked a few images, you can tell the program to generate a wireframe. This will be very rough initially,



With *3DSOM Pro*, you can work with uncalibrated images by performing a manual alignment. These can be used thereafter as geometry or texture sources

but it does enable you to utilise the program's most innovative masking tool. In subsequent photos, the wireframe model can be used to define approximate bounds of the background, giving the program less area to consider when calculating a mask.

You can rebuild the wireframe every few images to further refine the process, until all of your images are masked and the final wireframe can be built. By using the Optimise option, the model will have any creases intelligently removed and be converted into a final object. If the model is targeted for mobile phones or the web, you can select the Subdivision option, which improves mesh quality and reduces file size.

Speaking of the web, the program also includes a Java web player, which you can use to provide user interaction with your online objects. This powerful tool comes with a variety of scripting options for modifying the object's behaviour.

3DSOM will also automatically build textures for you. Like the competition, you can optionally select which photos to include or exclude. It uses a series of algorithms to even out lighting-based colour variations, but you can also have position-dependent textures, which have highlights and shadows according to which angle they're viewed from. There's also an innovative Texture Editor to refine textures.

By far the biggest limitation of silhouette-based photogrammetry is the fact that it can't model concave surfaces, and this program is no different. Creative Dimension says that it will release Boolean operators as a free upgrade within the next year. For now, your sole remedy is to export your models, reshape them in another program and import them back for texturing.

Overall, there's a knack to using *3DSOM Pro*, but once you've mastered it, you can produce excellent results. ●

RELATED PRODUCTS

- *D Sculptor*
Reviewed: Issue 11
- *iModeller 3D 2.5*
Reviewed: Issue 58
- *ImageModeler 4*
Reviewed: Issue 59



Although the program makes masking easier than ever before, obvious options like a magic wand or a magnetic lasso are not present



Because you can assign a clipping plane that shears off the base of your model, you don't need to mask that area in too much detail

VERDICT

PROS

- Easy to understand
- Enhanced masking tools
- Includes web player

CONS

- Can't model concave surfaces
- Some masking tools still absent

RANGE OF FEATURES

7

VALUE FOR MONEY

5

OVERALL

7

3DSOM Pro

featured in this month's 3DWorld magazine...



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3DWorld Magazine #66

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DETAILS

FOR
Cinema 4D 9
PUBLISHER
3D Fluff
PRICE
£49 / \$86* / €71*
*Currency conversion
RUNNING TIME:
4 hours



Training for Cinema 4D – Vol 3: Non-organic Modelling

Following sessions on basic modelling/rendering and radiosity lighting, this third 3D Fluff DVD delves deeper into C4D's modelling tools. It covers the construction of a detailed remote control handset, but also features a smaller section on the creation of a mini-torch, plus a brief collection of modelling tips.

We were a little harsh on the previous volume, which focused on the specifics of a single radiosity scene. However, this new tutorial incorporates many techniques and tips – while the end result is still a single

(beautifully constructed) model, you'll learn a lot about version 9's toolset.

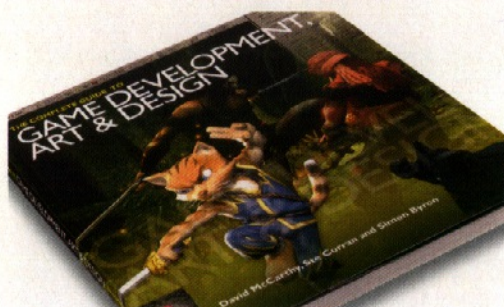
The tutorial offers a useful overview of C4D's unique system of modelling, and provides a solid grounding in the excellent subdivision surfaces with great audio and video, top-notch modelling tips and genuine expert tutoring. We still think it's a tad pricey, but you can't argue with the quality.

VERDICT

A top-quality training DVD that explores the layers of C4D 9 with a touch of class **9**

DETAILS

AUTHORS
David McCarthy, Ste Curran and Simon Byron
PUBLISHER
ILEX
PRICE
£20 / \$36* / €29*
*Currency conversion
PAGES
192
ISBN
1-904705-48-0



The Complete Guide to Game Development, Art & Design

The title doesn't lie: *The Complete Guide to Game Development, Art & Design* really does cover the entire development process, from pitch to public relations.

As a result of the scope of this book, you get a solid overview of how modern games are made; unfortunately, fine detail suffers. Art, in particular, is confined largely to thumbnail reviews of 3D packages – the type that tend to cause sharp intakes of breath when posted in CG forums.

However, the book is strong on the philosophy of game design, wide-ranging in

its case studies, and backed up by extensive Q&A interviews. And, as might be expected from former *Edge* journalists Curran and McCarthy, the captions and thumbnail reviews are cherishable.

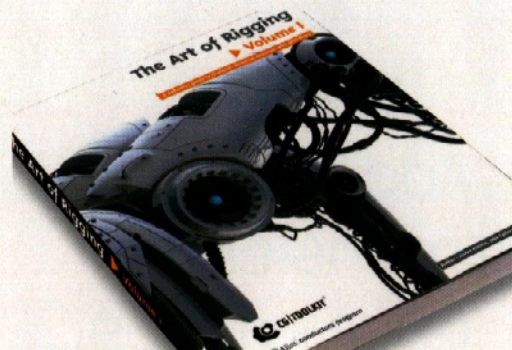
One note on Assembler, for example, reads simply that it presents "a headache for mortals. Masters of Assembler rarely count themselves in that group."

VERDICT

Unlikely to trouble Gamasutra members, but an entertaining, well-produced overview **7**

DETAILS

AUTHORS
Kieran Ritchie, Jake Callery, Karim Biri
PUBLISHER
CG Toolkit
PRICE
£33* / \$59 / €48*
*Currency conversion
PAGES
251
ISBN
0-9768003-0-6



The Art of Rigging Vol 1

As a contributor to ACP (Alias' certified third party plug-in scheme), has CG Toolkit hit the mark with its first book?

We assumed that *The Art of Rigging* would be the company's existing training DVD – *The Making of Leon* – in book form, sharing the same information. We were wrong. *Leon* merely touched on rigging in comparison to this.

Aimed at Maya intermediates who want to improve their knowledge of MEL scripts and rigging, this book provides a thorough understanding of the fundamental

principles of rigging a character, including a wonderful chapter on facial rigging. In fact, every chapter is a wealth of knowledge and humour, which really helps to break up some of the heavy MEL scripting (and there's plenty of it). And, just in case, there are nine hours of Gnomon-esque tutorials supplied on a DVD as well. If you liked *The Making of Leon*, you'll love this. And it looks gorgeous.

VERDICT

Another surefire hit, and a must for character animators who want to turn a hobby into a career **10**

DETAILS

FOR
Photoshop CS2
PUBLISHER
Total Training
PRICE
£166* / \$299 / €243*
*Currency conversion
RUNNING TIME
21 hours 50 minutes



Total Training for Adobe Photoshop CS2

The latest version of *Photoshop* introduces many exciting new features, and this product aims to help you get to grips with them.

Narrated by the legendary and ever-witty Deke McClelland, the presentation remains at the stratospheric heights set by previous versions. However, the product is flawed in several ways. First, it only works in a computer, not a conventional DVD player, so you need two screens to use it if you don't want to flip back and forth between windows. Second, the video is fixed at a window size that looks very small if you

view it on a 1,600x1,200 display. You can't maximise this, because it plays in a custom viewer. Most frustrating of all, because it starts from the basics, the video covers the ground of previous products but doesn't explain all of the new functionality in this version of *Photoshop*. To get this, you have to buy the so-called 'Advanced' version, which will cost an additional \$150.

VERDICT

Entertaining, enjoyable to watch and highly educational, but the irritations are overwhelming **7**

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**Suburban
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Buyer's guide

Whether you want advice on choosing a specific software package, or an overview of what's on the market, this database of past 3D World reviews contains the information you need to make the right buying decision

Online Resources



● This guide lists prices in Pounds Sterling and US Dollars. For a quick currency conversion: www.xe.com



● For non-3D software, our new online portal holds a wide range of reviews: www.3dworldmag.com



When new 3D users contact the magazine, the most common question they ask is: "Which software package should I buy?" To which the honest response is: "That really depends on you."

Unlike Web design or 2D illustration, there's no single, well-established software package that all professionals use. Instead, choosing a 3D application is largely a matter of personal requirements, not to mention individual taste. Before you begin downloading demos, however, it does help to have a broad overview of what's available – and that's where this buyers' guide comes in.

In this guide, you'll find a list of the key software packages in a particular market sector, the issue of the magazine in which each one featured and a brief summary of the review. These summaries represent a single reviewer's opinion, but they should give you an idea of the key characteristics of each application.

QUESTIONS, QUESTIONS...

Before diving in, there are two fundamental questions you should ask. Firstly, are you pursuing 3D as a professional career? And secondly, what kind of 3D work do you aim to produce?

If the answer to the first question is 'no', the only limitations on your choice of 3D software are your budget and operating system. In the hands of a skilled user, inexpensive applications can generate impressive results, although they might not do so as quickly as more expensive software (or in a way that professional 3D artists would deem conventional).

If you do aim to make a living in 3D, however, you'd be well advised to pick a 'professional' application: those listed in the upper table on the page opposite. Expensive packages don't necessarily generate better results, but they tend to produce work quickly,

flexibly and reliably – all important issues if deadlines are looming. And while studios don't usually hire staff solely on the basis of the software they've used, mastering a 'name' application will familiarise you with high-end tools and increase your chances of freelance work.

Another consideration is whether you intend to produce animations or still images. As a crude generalisation, illustrators and graphic artists often favour pro applications at the lower end of the price scale, while those working in animation, visual effects or game design tend to opt for more expensive packages.

Ultimately, however, there's no substitute for hands-on experience. All major applications have demo versions that you can

CHOOSING APPLICATIONS IS ALL ABOUT PERSONAL REQUIREMENTS AND INDIVIDUAL TASTE

download and experiment with, and before you reject the more expensive packages, remember that many of them – particularly *Maya*, *Houdini*, *LightWave* and *Softimage|XSI* – have free 'learning' editions. Educational deals also offer students the chance to buy full versions of professional software for the price of a handful of DVDs: to see if you qualify, check the website of the software package you're interested in.

Fortunately, there are very few 'bad' 3D packages on the market, so choosing the right one for you ultimately comes down to personal taste. Do your research, consult the magazine, and be prepared to experiment – but above all, enjoy yourself!

ALL-ROUND 3D PACKAGES (UNDER £250)

PRODUCT	FORMAT	DESCRIPTION	PRICE	DEVELOPER	WEBSITE	ISSUE	VERDICT	SCORE
AIST MOVIE 3D	PC	Cut-down version of <i>Realsoft 3D</i> , aimed mainly at home movie makers dabbling in 3D	£68* (\$132*)	AIST	www.aist.com	N/A	[Not previously reviewed in 3D World]	N/A
CARRARA 3D BASICS 2	Mac/PC	Extremely stripped-down version of a mid-price app, aimed at hobbyists and casual users	£69 (\$99)	Eovia	www.eovia.com	N/A	[Not previously reviewed in 3D World]	N/A
CARRARA 4 STANDARD	Mac/PC	Inexpensive all-rounder, lacking some of the high-end tools from <i>Carrara 4 Professional</i>	£209 (\$279)	Eovia	www.eovia.com	60	Still a solid purchase for a novice all-round 3D user on a budget, <i>Carrara 4</i> fixes bugs from earlier versions, but lacks the new rendering tools of the <i>Pro</i> edition	8
GAMESPACE	PC	Cut-down <i>trueSpace</i> with extra games tools, aimed at modders and indie game developers	£154* (\$299)	Caligari	www.caligari.com	46	Goes some way to providing a one-stop solution for the mod community, but one with rough edges on release: those on a real budget may stick to freeware	7
HASH ANIMATION:MASTER	Mac/PC	Cult entry-price animation app: chosen by many leading animators for personal work	£154* (\$299)	Hash Inc.	www.hash.com	59	Powerful, intuitive rigging and animation package, complemented by a simple, versatile modeller. Now adds hair support and a sprite-based particle system	9
PIXELS 3D 5	Mac	The premier – and possibly sole – Mac-only 3D package: a cult app amongst Mac fans	£77* (\$149)	Pixels Digital	www.pixelsdigital.com	42	Great value for money, and includes a number of high-end tools, including fluids and cloth. Good render quality, but very slow, and workflow could be improved	8
REALSOFT 3D 5 (FOR LINUX)	Linux	Even better value than the PC edition: most Linux users' main alternative to freeware	£136* (\$245*)	Realsoft Graphics	www.realsoft.com	35	[Reviewed at version 4] Excellent render quality but more suited to still images than animation, particularly character animation. OpenGL could be improved	9
SHADE 7 DESIGNER LE	Mac/PC	Very inexpensive, if limited, all-round package: extremely popular with hobbyists in Japan	£56* (\$109)	Curious Labs	www.curiouslabs.com	58	Clearly geared towards the student or amateur, this cheap and cheerful version of its bigger siblings shares the basic modelling tools but is otherwise limited	7
SHADE 7 STANDARD	Mac/PC	Mid-level edition: more expensive than LE, but lacks some key tools of <i>Shade 7 Pro</i>	£107* (\$209)	Curious Labs	www.curiouslabs.com	58	Similar in toolset to the <i>Professional</i> edition, but lacks automatic smoothing and interpolation. A reasonable buy, if you can handle the translation issues!	7



ALL-ROUND 3D PACKAGES (OVER £250)

PRODUCT	FORMAT	DESCRIPTION	PRICE	DEVELOPER	WEBSITE	ISSUE	VERDICT	SCORE
3DS MAX 7.5	PC	Long-established 3D package, still a standard in the games and architecture industries	£2,695 (\$3,495)	Autodesk	www.autodesk.com	66	A solid half-point release – although only available to subscribers – 3ds Max 7.5 adds hair and fur, architectural features and better mental ray rendering	8
CARRARA 4 PRO	Mac/PC	Inexpensive all-round app, now targeted more specifically at professional illustrators	£419 (\$579)	Eovia	www.eovia.com	60	Retains Eovia's unique – and possibly offputting – system of workflow divided into 'rooms', but dramatically improves animation and high-end rendering	8
CINEMA 4D 9 BASE	Mac/PC	Entry-level edition only; some important tools must be purchased as add-on modules	£425 (\$695)	Maxon	www.maxon.net	58	Not as ground-breaking an upgrade as version 8, but builds on previous incarnations to deliver a capable all-round professional 3D package	9
CINEMA 4D 9 XL	Mac/PC	A powerful renderer makes this increasingly respected app the choice of many illustrators	£1,148 (\$1,895)	Maxon	www.maxon.net	58	[This edition not specifically reviewed in 3D World] Pricier than LightWave, but the MOCCA and Advanced Render modules are essential to many pro artists	9
CINEMA 4D 9 STUDIO	Mac/PC	Top-level edition of Cinema 4D adding in BodyPaint 2 and unlimited network rendering	£1,871 (\$2,995)	Maxon	www.maxon.net	58	[This edition not specifically reviewed in 3D World] Primarily for large facilities needing unlimited render licenses, although BodyPaint 2 is a useful added extra	9
ELIAS 5.5	Mac/PC	Perennial professional-quality animation package with a strong cult following	£463* (\$895)	EI Technology Group	www.eitechnologygroup.com	59	Still an insanely fast rendering and animation package, but now minus a built-in modeller since the last – admittedly thorough – point release	8
HOUDINI 7 MASTER	PC/Linux	Powerful procedural animation package, few skilled users, but a staple of much VFX work	£8,759* (\$17,000)	Side Effects Software	www.sidefx.com	41	[Reviewed at version 6] Retains all the power of previous versions, but makes considerable advances in terms of ease of use. Also adds GI rendering	8
LIGHTWAVE 3D 8	Mac/PC	Another long-established package, used in a wide range of work, notably TV effects	£440* (\$795)	NewTek	www.newtek.com	53	Vastly improves character animation and dynamics, and streamlines workflow, but leaves the renderer and underlying structural problems of the app untouched	8
MAYA 6.5 COMPLETE	Mac/PC/Linux	Lacks some high-end tools, but an affordably priced edition of Maya for many 3D markets	£1,499 (\$1,999)	Alias	www.alias.com	64	Still the one to beat in many fields of 3D, but although much faster and slicker, many felt that Maya's last point release lacked that elusive 'wow' factor	7
MAYA 6.5 UNLIMITED	Mac/PC/Linux	Powerful all-round package: still the one to beat when it comes to film effects work	£4,899 (\$6,999)	Alias	www.alias.com	64	Slicker rendering in mental ray, but it's not exactly a perfect upgrade – it feels like half an improvement. Artists on a budget may want to wait for Maya 7	7
REALSOFT 3D 5 (FOR PC)	PC	Underpublicised, but well-regarded, mid-priced application, good built-in renderer	£415* (\$795*)	Realsoft Graphics	www.realsoft.com	61	Enhanced Sub D modelling and texturing make this a viable alternative to better-known 3D illustration apps. Still weak at character animation, however	9
SHADE 7 PRO	Mac/PC	Very popular Japanese package. Still relatively unknown in the West, but may gain ground	£521* (\$1,009)	Curious Labs	www.curiouslabs.com	58	Robust modelling tools and a reasonably powerful renderer, but the interface and animation tools will seem unconventional to many Western 3D artists	7
SOFTIMAGE XSI 4 FOUNDATION	PC/Linux	Aggressively marketed entry-level edition of a leading 3D app: very powerful for the price	£299 (\$495)	Softimage	www.softimage.com	55	Fuller-featured than many entry-level editions of major packages, Foundation – originally sold for \$1,995 – sets a new benchmark for 3D software pricing	9
SOFTIMAGE XSI 4 ESSENTIALS	PC/Linux	Powerful, well-balanced all-round package, also much reduced in price over the last year	£1,275 (\$1,995)	Softimage	www.softimage.com	55	A solid upgrade to a powerful package, adding new rigid-body dynamics, a fully non-linear modelling workflow and improved texturing and materials tools	9
SOFTIMAGE XSI 4 ADVANCED	PC/Linux	Widely used in games and VFX, but struggles for market dominance with 3ds Max and Maya	£4,485 (\$6,995)	Softimage	www.softimage.com	55	For power users, XSI 4 Advanced also throws in BatchServe and eight satellite render licences for free. Still no decent NURBS or curve tools, though	9
STRATA 3D CX	Mac/PC	Long-established, if relatively niche, mid-price 3D package: now targeted at illustrators	£346* (\$695)	Strata	www.strata.com	55	A capable, if idiosyncratic, package for a print graphic artist looking to team Photoshop and Illustrator with a little 3D. Far weaker for animation, however	7
TRUESPACE 6.6	PC	Another fixture in the increasingly crowded mid-price 3D software market; still widely used	£310* (\$595)	Caligari	www.caligari.com	30	Improving animation and dynamics, version 6.6 addresses many of trueSpace's shortcomings, but the current interface now looks to have reached its limits	8

TALKING POINT | A question of timing

FIVE YEARS AGO, most 3D developers operated on an 18-month schedule. However, as the cost of major apps has fallen, so has the time between full-point releases, with a 12-month cycle becoming the norm. According to analysts, this reflects a new business model: that of a service industry, with revenue being generated increasingly from maintenance contracts,

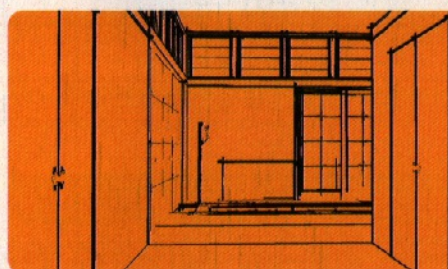
rather than initial sales. This is less popular with smaller users, since it often results in upgrades with fewer major 'headline' features or made available only for subscribers. Is quality being sacrificed for regularity? Decide for yourself with our reviews of the first of this year's upgrades to major applications. **Softimage|XSI 5** is reviewed on page 80 **Maya 7** is reviewed on page 82

TEXTURING

PRODUCT	FORMAT	DESCRIPTION	PRICE	DEVELOPER	WEBSITE	ISSUE	VERDICT	SCORE
BODYPAINT 3D 2	Mac/PC	Powerful specialist 3D painting package, used on increasingly high-profile VFX projects	£425 (\$745)	Maxon	www.maxon.net	47	Much quicker and simpler to use than the first release, and results can be stunning. Rock solid and well documented, but one for specialist texture artists	9
GENETICA 2 PRO	PC	Create an infinite variety of seamlessly tileable textures with minimal effort	£228 (\$399)	Spiral Graphics	www.spiralgraphics.biz	69	An asset for busy professionals, Genetica 2 is a versatile and easy-to-use application. You can also create bump maps, although not animated textures	8
PAINT SHOP PRO 9	PC	Inexpensive 2D painting and bitmap editing app, unfairly regarded as 'just for hobbyists'	£99.95 (\$129)	Corel	www.corel.com	57	Fantastic value for money, and version 9 adds a proper History palette. Does nearly anything that Photoshop can, but needs better alpha channel support	9
PHOTOSHOP CS2	Mac/PC	The de facto standard for texture painting and image manipulation amongst CG artists	£523 (\$999)	Adobe	www.adobe.com	68	Still de rigueur for pro 3D work, with enough enhancements – such as support for HDR images and the Smart Objects feature – to make this the best version	9

MODELLING

PRODUCT	FORMAT	DESCRIPTION	PRICE	DEVELOPER	WEBSITE	ISSUE	VERDICT	SCORE
AMAPI DESIGNER 7	Mac/PC	Long-established modelling package, boasting a unique workflow and interface	£339 (\$479)	Eovia	www.eovia.com	40	A powerful modelling package, particularly for organic objects, although users will either love or loathe the interface, and documentation could be improved	9
AMAPI 7.5 PRO	Mac/PC	Amapi Designer's new bigger sibling, intended as a serious alternative to pricier applications	£559 (\$779)	Eovia	www.eovia.com	62	Professional version of Amapi, aimed at industrial modelling. Superb Dynamic Geometry and better NURBS modelling but tool/command validation is tricky	9
FORM-Z 5	Mac/PC	Powerful, long-established all-round modeller, used on a wide range of industrial projects	£794* (\$1495)	Auto•des•sys	www.formz.com	63	This is a premium modelling package – a hybrid solid and surface modeller. With strong NURBS tools and decent renderer, it has a steep learning curve	8
MODO	Mac/PC	Powerful, customisable and Mac-friendly new Sub-D modeller, created by ex-NewTek staff	£359* (\$695)	Luxology	www.luxology.com	60	A relatively pricey addition to a crowded market sector, but one with a uniquely customisable modular design. Some early stability issues, but improving rapidly	8
RHINO 3	PC	Another well-established app, at the lower end of the price scale for industrial modellers	£462* (\$895)	Robert McNeel & Associates	www.rhino3d.com	36	New NURBS tools and shading modes make this package a strong all-rounder. Will soon need upgrading to keep pace with newer competitors, however	8
SILO	Mac/PC	New specialist Sub-D modelling package, inexpensive, and improving with every build	£56* (\$109)	Nevercenter	www.nevercenter.com	55	Has evolved into a promising app, following early stability issues. Quirky UV mapping, but good crossover between Sub-D and poly tools, and customisable	9
SOLIDTHINKING DESIGN 6.5	Mac/PC	A thankfully uncomplicated NURBS modelling tool for professional 3D artists	£1,579* (\$2,745)	solidThinking Ltd	www.solidthinking.com	69	A somewhat expensive, though outstanding, NURBS modeller that has the shallowest of learning curves for absolute beginners	9
ZBRUSH 2	Mac/PC	Powerful, intuitive organic modelling package currently gaining very strong word of mouth	£252* (\$489)	Pixologic	www.zbrush.com	53	A new interface helps redefine ZBrush 2 as a professional 3D sculpting tool. Still some quirks, but many unique tools and capable of handling millions of polys	9



TALKING POINT | A modeller by any other name?

ONE OF THE HAZARDS of compiling a buyer's guide is receiving letters from people who feel that their favourite software has been assigned to the wrong section of the list. Joining ZBrush (modeller, texturing app,

or both?) in the inbox-blocking category is SketchUp 5. Architectural tool, sketching package, 3D modeller – or just fun to use? Decide for yourself in our reviews section. SketchUp 5 is reviewed on page 88

CHARACTER AND FACIAL ANIMATION

PRODUCT	FORMAT	DESCRIPTION	PRICE	DEVELOPER	WEBSITE	ISSUE	VERDICT	SCORE
DAZ/STUDIO	Mac/PC	Long-awaited new rival to Poser, currently still available as a free public beta	Free	DAZ Productions	www.daz3d.com	N/A	[Not previously reviewed in 3D World]	N/A
ENDORPHIN 2	PC	Innovative motion synthesis system using AI 'actors' to generate artificial mo-cap data	£7,995 (\$12,795)	NaturalMotion	www.naturalmotion.com	67	Brilliant, technically accomplished, and fun to use, to boot. Generates data no real-world stuntman could achieve. Uses unique AI-powered virtual stuntmen	9
FACESTATION 2	PC	Turn video footage of an actor's face into instant animation: for 3ds Max and Maya	£1,041* (\$1,995)	Digimation	www.digimation.com	33	Fast facial tracking, and can work with real-time capture. Resource hungry, however, and the quality of the results is only as good as your morph targets	8
LIFESTUDIO:HEAD 2.5 STANDARD EDITOR	PC	Customise a pre-built head model, apply instant lip synch and export as OBJs or an AVI	£310 (\$599*)	LifeMode Interactive	www.lifemod.com	44	Good texturing tools, but some tweaking is required to finesse the lip synch generated automatically from an audio track. Manual and UI need tidying up	8
LIFESTUDIO:HEAD 2.5 PRO ARTIST	PC	Create and rig facial models for 3ds Max and Maya, then apply instant lip-synching	£990 (\$1,914*)	LifeMode Interactive	www.lifemod.com	44	As the Standard Editor, but with the power to import/export directly to Maya or 3ds Max. One of the first proper tools of this kind: a time-saver for games artists	8
MESSIAH:ANIMATE 5	PC	Powerful standalone animation package, also available as a plug-in for major 3D packages	£125* (\$239)	pmG Worldwide	www.projectmessiah.com	29	[Reviewed at version 3] A comprehensive character animation solution with very fast IK and deformation and powerful expressions. Now reduced in price	8
MESSIAH:STUDIO 2	PC	Messiahanimate's larger parent product, adding in full rendering capabilities	£518* (\$995)	pmG Worldwide	www.projectmessiah.com	58	Not an industry-standard application (and lacks modelling tools), but offers intuitive, fast and powerful GL rendering and is capable of some amazing results	7
MOTIONBUILDER 6 STANDARD	Mac/PC	Innovative 'motion design' package, originally developed by Kaydara, now owned by Alias	£532* (\$995)	Alias	www.alias.com	46	[Reviewed at version 5] Powerful FK/IK blending and real-time playback, plus a new Story Window to keep things organised. Quickly becoming indispensable	9
MOTIONBUILDER 6 PRO	Mac/PC	Pro motion-editing app: an industry standard for blending mo-cap and keyframe data	£2,244* (\$4,195)	Alias	www.alias.com	62	High-end tools include mo-cap data editing and data retargeting. It might be a tad expensive, but it's probably the best character animation tool around	8
POSER 6	Mac/PC	The original figure-posing application, also used for pre-viz and simple animation work	£157 (\$249)	Curious Labs	www.curiouslabs.com	65	Despite a few niggles, well-chosen workflow enhancements and a lot of new content make Poser 6 a vital upgrade. Still undisputed champ in its market sector	8

RENDERING (packages previously reviewed in 3D World only)

PRODUCT	FORMAT	DESCRIPTION	PRICE	DEVELOPER	WEBSITE	ISSUE	VERDICT	SCORE
ART-LANTIS 4.5	Mac/PC	Old-school architectural rendering package, now awaiting an update to version 5.0	£349	Abvent	www.abvent.com	13	This interactive package is capable of high-quality results and provides decent renders quickly without fuss. Few fine controls, though, and not recently updated	7
BRAZIL R/S	PC	Powerful 3ds Max renderer, used in both stills and effects work: soon to be ported to Maya	£617* (\$1,200)	SplutterFish	www.splutterfish.com	31	Fast and robust, with an excellent shader system, delivering high-quality results. Bucket rendering allows fast distributed rendering across a network	9
FINALRENDER STAGE-1	PC	Another powerful 3ds Max renderer, often used in architectural visualisation work	£415* (\$795)	Cebas	www.finalrender.com	43	Powerful new HyperGI engine and caustics tools, but exceptional results require a lot of tweaking. Some instabilities, particularly in distributed renders	7
TURTLE	Mac/PC/ Linux	Third-party Maya renderer, designed to offer a new balance of speed and image quality	£619* (\$1,199)	Illuminate Labs	www.illuminatelabs.com	55	Blisteringly fast raytrace rendering. Currently best suited to architectural work due to lack of support for particles and Point Effects, but developing rapidly	7

LANDSCAPE GENERATION

PRODUCT	FORMAT	DESCRIPTION	PRICE	DEVELOPER	WEBSITE	ISSUE	VERDICT	SCORE
BRYCE 5.5	Mac/PC	The original landscape generator: now back in development after several years in limbo	£70* (\$110)	DAZ Productions	bryce.daz3d.com	68	Not the most powerful app on the market, but a very affordable one. Bryce is easy to use, and 5.5 offers faster rendering and extended OpenGL support	9
MOJOWORLD 3	Mac/PC	Unusual landscape-generation app with a unique emphasis on creating entire planets	£103* (\$199)	Pandromeda	www.pandromeda.com	60	A unique approach to landscape generation that tends to polarise opinion. Great tools, but hard to control fine details and the interface can be frustrating	6
VUE 5 ESPRIT	Mac/PC	Landscape generation's current market leader: high-quality results at an affordable price	£171 (\$249)	e-on Software	www.e-onsoftware.com	59	Rightly the best-selling landscape generator: very realistic results, and easy to master. New GI rendering is slow, however, and still no proper animated water	9
VUE 5 PRO STUDIO	Mac/PC	The <i>Vue 5 Esprit</i> core, augmented by four add-on modules (also purchasable separately)	£274 (\$399)	e-on Software	www.e-onsoftware.com	65	A well-rounded set of add-ons. Although some features should arguably be in the core app, <i>Mover</i> (Poser import) and <i>Botanico</i> (plant editing) are of real value	8
VUE 5 INFINITE	Mac/PC	Pro-level edition of Vue, aimed at architectural and VFX work. Formerly known as <i>Vue 4 Pro</i>	£411 (\$599)	e-on Software	www.e-onsoftware.com	66	Powerful, intuitive and configurable, <i>Vue 5 Infinite</i> leads where other landscape apps dare not follow. Relatively pricey, but capable of incredible-quality results	8
WORLD CONSTRUCTION SET 6	Mac/PC	Technical, but very powerful, package: well-suited to tasks requiring real-world accuracy	£258* (\$500)	3D Nature	www.3dnature.com	13	[Reviewed at version 5] A versatile and comprehensive landscape program, but the interface is unintuitive with a steep learning curve and no simple mode	8
WORLDBUILDER GENESIS	PC	A popular alternative to the Vue family: more powerful than Bryce, less technical than WCS	£92* (\$179)	Digital Element	www.digi-element.com	57	Beautiful end results and fairly easy to use. Now very much optimised for 3ds Max, though, while some of the new features and the tutorials lack polish	7
WORLDBUILDER PRO 4	PC	Higher-end edition of <i>WorldBuilder</i> , tailored to pro graphics artists rather than hobbyists	£360* (\$699)	Digital Element	www.digi-element.com	57	A terrific program with many unique features, particularly for plant and water animation, and great user control over fine detail – but see reservations above	7

COMPOSITING

PRODUCT	FORMAT	DESCRIPTION	PRICE	DEVELOPER	WEBSITE	ISSUE	VERDICT	SCORE
AFTER EFFECTS 6 STANDARD	Mac/PC	One of the most popular desktop compositing packages, usable even for broadcast work	£565 (\$699)	Adobe	www.adobe.com	47	Updated video painting features, plus the addition of Photoshop's Liquefy tool make for a major upgrade. Still the same cluttered old interface, however	8
AFTER EFFECTS 6 PROFESSIONAL	Mac/PC	As <i>After Effects Standard</i> , plus some high-end tools: worth investing in for professional work	£915 (\$999)	Adobe	www.adobe.com	47	Motion tracking, enhanced keying and masking, particle systems and 16-bit colour space tools make this a better option than <i>AE Standard</i> for serious work	8
COMBUSTION 4	Mac/PC	Autodesk's own desktop compositor, unsurprisingly often teamed with 3ds Max	£850 (\$995)	Autodesk	www.autodesk.com	65	Very strong basic tools, well-organised workflow and good compatibility with 3D apps, but poorer editing app integration and a relatively steep learning curve	9
DFX+ 4	PC	Cut-down, modular version of <i>Digital Fusion</i> , much beloved of PC-based <i>LightWave</i> artists	Priced by module	eyeon Software	www.eyeonline.com	43	Most of the improvements in version 4 are cosmetic, but still a powerful, affordable, node-based compositing app. Good visual effects and 3D tools	8
DIGITAL FUSION 4	PC	One of the first PC-based desktop compositing packages, but still relatively little known	£2,579* (\$4,995)	eyeon Software	www.eyeonline.com	43	Not limited to 8-bit colour space, unlike <i>DFX+</i> , making this a powerful – and underrated – PC-based compositor, capable of scaling to film-quality work	8
SHAKE 3.5	Mac/Linux	Powerful node-based desktop compositor, used even in film and broadcast effects	£2,099 (\$2,999)	Apple	www.apple.com	54	The most powerful desktop compositor on the market, with the possible exception of <i>Digital Fusion</i> . Version 3.5 adds long-awaited morphing tools	8

CAMERA TRACKING AND MATCH MOVING

PRODUCT	FORMAT	DESCRIPTION	PRICE	DEVELOPER	WEBSITE	ISSUE	VERDICT	SCORE
3D-EQUALIZER 3	Mac/Linux	Venerable (and Oscar-winning) tracking package, still widely used in film effects	On request	Science D Visions	www.3dequalizer.com	N/A	[Not previously reviewed in 3D World]	N/A
BOUJOU 3	Mac/PC/Linux	One of the first major alternatives to <i>3D-Equalizer</i> , popular in the effects world	£5,190* (\$10,000)	2d3	www.2d3.com	64	Version 3 is still a powerful tracking package, but this much-delayed and largely unsurprising update may prove a disappointment to long-term <i>boujou</i> users	6
BOUJOU BULLET	Mac/PC/Linux	Cut-down, wizard-driven version of <i>boujou</i> , intended for small to medium-sized facilities	£1,307* (\$2,500)	2d3	www.2d3.com	64	Aimed at smaller post facilities, <i>Bullet</i> has good basic 2D and 3D tracking and accepts any resolution footage, but can prove unreliable with zoom shots	7
MATCHMOVER PRO 3.1	Mac/PC/Linux	Another of the old guard of desktop tracking applications, recently reduced greatly in price	£2,062* (\$3,500)	RealViz	www.realviz.com	63	A highly evolved version of the software, with powerful 2D and 3D tracking tools. No optical flow facility, however, and the mo-cap module costs a lot extra	7
PFHOE	Mac/PC	A powerful low-cost DV tracking application, named by <i>3D World</i> readers (see Issue 61)	£49 (\$94)	The Pixel Farm	www.thepixelfarm.co.uk	62	With fast and robust auto-tracking, <i>PFHoe</i> is great value for money and ideal for its target audience of aspiring digital filmmakers and independent artists	9
PFMATCH	Mac/PC	<i>PFTrack</i> 's younger sibling, offering a useful range of tracking tools at an entry-level price	£600 (\$1,150)	The Pixel Farm	www.thepixelfarm.co.uk	57	Great price, although only broadcast-resolution footage in AVI and QT formats is supported. Good user control in version 1.5, but no proxy-resolution tracking	8
PFTTRACK 3	Mac/PC	First of a new generation of lower-priced broadcast-quality camera tracking packages	£3,000 (\$5,000)	The Pixel Farm	www.thepixelfarm.co.uk	66	Fast, powerful, and now boasting true object tracking, <i>PFTrack 3</i> is arguably the most complete, and completely useful, tracking system currently available	9
SYNTHEYES	PC	Astonishingly affordable new all-round tracking package, gaining good word of mouth	£180* (\$349)	Andersson Technologies LLC	www.ssonetech.com	49	An incredible range of tools for the price. Outperforms costlier rivals on many tasks, but workflow can feel counter-intuitive for those used to other apps	9



TALKING POINT | Life's just flat without them

BACK IN 2002, it seemed that every other press release we received was for a new image-based modelling package. But while the power to turn photographs into 3D models remains a valuable one, the

applications themselves now receive far less media coverage. Attempting to change all this is *3DSOM Pro*. But can it oust old rivals *ImageModeler* and *iModeler* (listed overleaf)? *3DSOM Pro* is reviewed on page 90

WEB 3D AND MULTIMEDIA

PRODUCT	FORMAT	DESCRIPTION	PRICE	DEVELOPER	WEBSITE	ISSUE	VERDICT	SCORE
ANARK STUDIO 3	PC	Established authoring package for interactive 3D presentations	£1,835* (\$3,499)	Anark	www.anark.com	64	A powerful solution for large-scale, real-time 3D, but the new higher price and absence of Mac support will leave some existing users high and dry	8
AXELEDGE 2	Mac/PC	All-in-one authoring and online animation package, described as 'like Flash in 3D'	£309* (\$595)	MindAvenue	www.mindavenue.com	33	Powerful all-round authoring package, with good animation and interaction editing tools. Import and export options much improved in version 2.0	8
CULT3D	Varies	Free software suite for exporting 3ds Max and Maya models in interactive online format	Free	Cycore	www.cycore.com	12	[Reviewed using the 3ds Max exporter] Relatively straightforward to use, with a good range of options in the exporter. Very much more stable in recent builds	7
DIRECTOR MX 2004	Mac/PC	De-facto standard for authoring multimedia CDs/DVDs; now incorporating simple 3D tools	£809 (\$1,099)	Macromedia	www.macromedia.com	37	Greatly improved layout, but few new 3D tools since version 8.5. Havok physics and useful web output tools, but programming needed for complex effects	7
QUEST3D 2.1 ENTERPRISE	PC	Real-time 3D authoring tool, also available in cheaper Lite and Professional editions	£1,035* (\$1,999)	Act-3D	www.quest3d.com	48	Full-featured all-round authoring app, but fairly easy to master: no programming required. Can become unmanageably cluttered on complex projects, though	8
SWIFT 3D 4.5	Mac/PC	3D to vector graphics conversion tool: one of the most regularly updated interactive 3D apps	£128* (\$229)	Electric Rain	www.erain.com	68	Version 4.5 of this 3D-to-Flash application offers up to a 50-fold increase in render speed over version 4, plus a major overhaul of the vector render engine	8
WIREFUSION 4 ENTERPRISE	Mac/PC/Linux	Visual authoring tool for interactive 3D content; also available in cheaper editions	£1,195 (\$1,995)	Demicron	www.demicron.com	56	Straightforward all-round authoring solution: no need for programming or specialist plug-ins to view output. Slightly unorthodox, but quick to master	8

OTHER TOOLS

PRODUCT	FORMAT	DESCRIPTION	PRICE	DEVELOPER	WEBSITE	ISSUE	VERDICT	SCORE
3DSOM PRO	PC	Image-based modelling software, once known as 3D S.O.M. A newer addition to the market	£1,495 (\$2,750*)	Creative Dimension Software	www.3dsom.com	43	Requires photos of an object against a marker grid like <i>D Sculptor</i> or <i>iModeler</i> , but offers greater automation and can use uncalibrated images for texturing	8
ANTICS PRE-VIZ	PC	A new real-time pre-visualisation tool for production, with a simple learning curve	£570 (\$995)	Antics Technologies	www.antics3d.com	69	A solid, intuitive pre-production tool, simple enough for even producers to use! Advanced functionality is still slightly fiddly, but the supporting tutorials are good	8
D JOINER	PC	Photo-stitching software: less widely known than <i>Stitcher</i> , but suitable for many projects	£300 (\$575*)	D Vision Works	www.d-vw.com	20	In good hands, it does what it's meant to do. But it suffers from poor usability and a lack of automated features. Documentation is disappointingly slim too	7
D SCULPTOR 2 STANDARD	PC	Image-based modelling software: another mid-priced package, aimed at home users	£500 (\$960*)	D Vision Works	www.d-vw.com	11	[Reviewed at version 1] A good tool for creating 3D models from images, and cheaper than <i>ImageModeler</i> . Much slower and not as powerful, however	8
DEEP EXPLORATION 3.5	PC	File conversion software: capable of tackling a wide range of file formats, including CAD	£77* (\$149)	Right Hemisphere	www.righthemisphere.com	45	Well-designed model viewer, file conversion and asset management utility. Includes basic 3D model editing tools, rendering and Shockwave output	8
FRAMEFORGE 3D STUDIO	Mac/PC	Storyboarding software: first of a new wave of apps aimed at previz and 3D storyboarding	£180* (\$349)	Innoventive Software	www.frameforge3d.com	55	Extremely easy to use, and scales to even high-budget movies. Specialised props only available as add-on packs, though, and complex scenes can be sluggish	9
IMAGEMODELER 4	Mac/PC	Image-based modelling software: one of the earliest desktop photogrammetry packages	£712* (\$1,390)	Realviz	www.realviz.com	59	Gives professional-quality results, and can cope with architectural-sized objects, but requires considerable user input. Quality also comes at a price	7
IMODELLER 3D 2.5 WEB	Mac/PC	Image-based modelling software: creates 3D models for online use, in a Java-based format	£70* (\$134*)	UZR	www.imodeler.com	58	Like the pro version but cheaper. With the right objects, this can produce quite impressive results. Wait until the release of version 3, which supports concavity	6
IMODELLER 3D 2.5 PRO	Mac/PC	Image-based modelling software: all-purpose app, exporting to a range of 3D file formats	£352* (\$675*)	UZR	www.imodeler.com	58	Impressive and more powerful than its main rival, <i>D Sculptor</i> , it has too many irritations. It may be easy to learn, but it's quirky and frustratingly unstable	6
NUGRAF 4.1	PC	File conversion software: powerful, with support for batch conversion and CAD data	£256* (\$495)	Okino	www.okino.com	21	[Reviewed at version 4] This affordable package performs a demanding task exceptionally well and is relatively affordable. User interface is a tad dated	8
PARTICLEILLUSION 3	Mac/PC	Particle software: generates 3D-style effects in 2D. Niche, but used on many pro projects	£206* (\$399)	Wondertouch	www.wondertouch.com	41	A fast, flexible alternative to conventional 3D particle effects, and fits well into production pipelines. Would be improved by more specific forces and user control	8
REALFLOW 3	Mac/PC/Linux	Fluid simulation software: the current market leader for realistic fluids, used in film projects	£620* (\$1,200)	Next Limit	www.nextlimit.com	60	Sets the benchmark for power and controllability for fluid simulation systems, but at a price. Still some stability and UI issues, particularly in the Mac version	7
STITCHER 4.0	Mac/PC	Photo-stitching: the leader in its field, though similar tools are now present in Photoshop	£299* (\$580)	Realviz	www.realviz.com	50	Incredibly powerful and versatile. Not a quick solution, but stands above the competition in quality of results, although that quality comes at a price	7
STORYVIZ	PC	Previsualisation software: the latest in a new wave of previz and storyboarding apps	£1,850* (\$3,600)	Realviz	www.realviz.com	60	Far more flexible and open-ended than simple storyboarding apps, and includes a timeline and keyframe animation capabilities. A serious investment, however	8



CONTACT US | Have we missed anything?

THINGS CAN CHANGE very quickly in the world of 3D software. If you've spotted an error in this buyer's guide, please contact us at the email address below. However, before writing in, please bear the following points in mind:

1. All prices exclude VAT and shipping, plus any optional extra costs, such as printed manuals or maintenance contracts.
2. Asterisks denote currency conversions from a list price at the current rate of exchange when the entry was added to the buyer's guide.

3. Due to limitations of space, not all sectors of the 3D market can be covered each issue. We aim to vary our listings from month to month.

4. Space also precludes us from listing the thousands of plug-ins currently available.

5. The verdict column contains a synopsis of our last published review. In most cases this will refer to the current version of the software. Where this is not so, it should be clearly noted.

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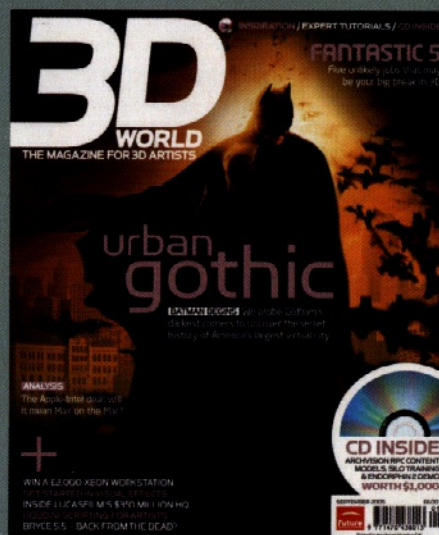
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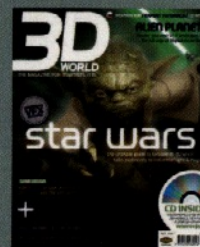


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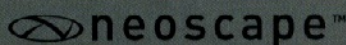
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TYPICAL NUMBER OF FULL-TIME RECRUITS PER YEAR

3-5

LOOKING FOR USERS OF WHICH 3D SOFTWARE?

- 3ds Max
- V-RAY
- Brazil
- form.Z
- AutoCAD
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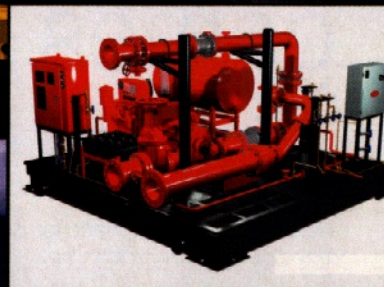


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- Import and compose 3D scenes from a plethora of 2D/3D file formats then render out to high quality images for print media, training manuals, or marketing brochures
- Popular for ProE, SolidWorks, STEP, etc. to D.C.C.
- Highly refined & popular MAX <-> Maya pipeline via native plug-ins, with over a decade of development
- Robust import & rendering of CAD and AEC models
- Publish to WEB streaming file formats such as Viewpoint VET, OpenHSF, SW3D, U3D, XGL & VRML1+2
- 17+ years development. Personal and dedicated hands-on support directly from the Okino developers
- Solid, robust solution used around the world by most major companies and professionals
- Easily develop new plug-in modules such as import/export, renderers, modelers, etc.
- Mesh & scene processing toolset

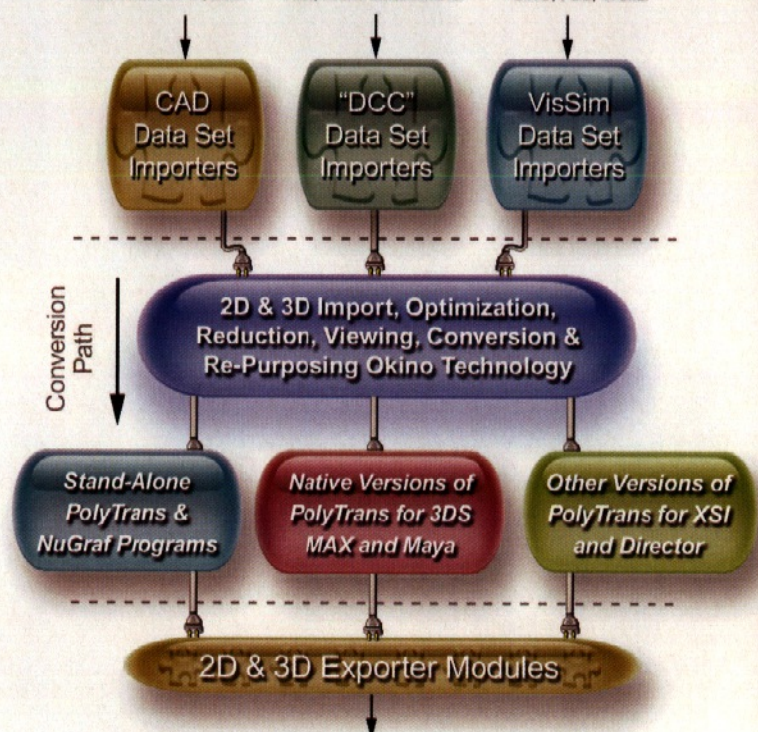
Major Features:

- Converts & optimizes all major CAD formats to MAX, Maya, XSI, LW, FLT and dozens more file formats and 3D programs
- 'Document-centric' architecture, extensive user interface plug-in system-level API, and 2D/3D import/export API
- Top notch smooth skinned mesh & skeleton conversion
- Recent converters: Inventor 10, U3D, XGL, PDB, BVH & Acclaim (Mocap), FilmBox 6, DWG 2005+, ACIS SAT R15, Houdini GEO, JT Open, XSI (shader trees + NURBS), CATIA v4 + v5.
- Excellent built-in polygon reduction system
- Integrated multi-media editor & viewer
- Integrated WEB & file search system
- All Granite CAD converters for US\$395 (ProE, ACIS, IGES, STEP, Parasolid)
- Animation conversion amongst MAX, FBX, Maya, XSI, Soft-3D, LW, DirectX, U3D & more
- "PolyTrans-for-3dsmax" & "PolyTrans-for-Maya"
- Plug-in modules from third party vendors, including AIR renderer from SiTex Graphics
- Scanline rendering, material editing & texture parameter editing in PolyTrans
- NuGraf only: Caustics, an amazing lens flare system & sunlight calculator

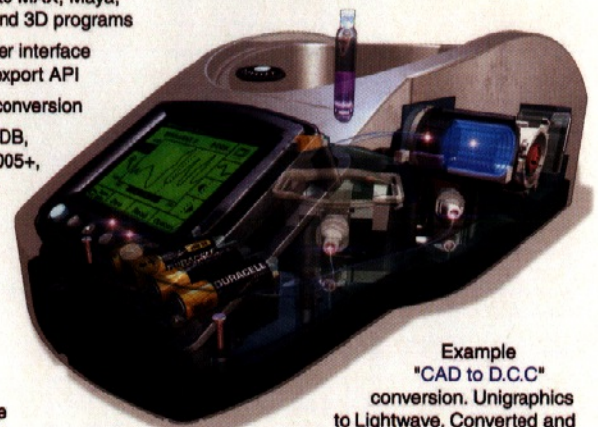
All major CAD formats
such as ACIS, DWG,
IGES, Inventor, Parasolids,
ProE, Solid Edge, CATIA,
SolidWorks, STEP, VDA.

All major "DCC" programs
such as 3ds max, Maya,
Softimage, Lightwave,
trueSpace, Cinema-4D,
FBX, Rhino-3D and more.

All major visual
simulation (VisSim)
programs & formats
such as OpenFlight,
DWG, PDB, VRML.



Apple 3DMF, Biovision and Acclaim motion capture, DirectX, DXF/DWG, Electric Image FACT, GameExchange2, HOOPS HSF, Inventor2/VRML (SGI), Lightscape, Lightwave, OpenFlight, OpenGL C/C++ code, POV, Pro/E SLP, Renderman RIB, Renderware/ActiveWorlds, Rhino-3D/OpenNURBS, Shockwave-3D, STL, Softimage|3D, Softimage|XSI, trueSpace, Viewpoint VET, VRML 1+2, Wavefront & XGL. Plus third-party free exporters.



Example
"CAD to D.C.C"
conversion. Unigraphics
to Lightwave. Converted and
optimized by PolyTrans. © 2005
CraneDigital, LLC, www.cranedigital.com.
HACH Odyssey DR/2500 Spectrophotometer.



Excellent support for
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Tel: (Toll Free) 1-888-3D-OKINO, (1-905) 672-9328

WEB: <http://www.okino.com> Email: sales@okino.com

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BUSINESS END

Each issue, our panel of experts answers the legal and financial questions of freelancers and small studios. This month, we ask ...

Advertising: why and how?

Q I'm the director of a company called Sovereign Multimedia, at which I'm responsible for sales and marketing. Although we don't have a large advertising budget, we have to start the ball rolling somewhere. Could you give us some feedback as to how we can develop our advertising and marketing strategy, and how much this would cost?

C LEAF, SOVEREIGN MULTIMEDIA

A Marketing is a numbers game - the more people that see your company's name, the more they'll think of you. Advertising has different benefits from general PR, and I would suggest that you do both. The advantages of direct advertising are that you can say anything that you want in it and convey your style of work more accurately. Online advertising is perfect for enabling visitors to click straight through to your website; if done correctly, you can measure exactly how well it's done by analysing the statistics.

First, you should set some objectives, as this will help direct your campaign in terms of content and cost, and also let you know if it has worked. Your advertising objectives could be structured as follows: make production companies aware of your services, increase sales by 20 per cent, attract investors, attract staff, or announce that you have a new piece of technology.

Now you can work out how much to spend and where to spend it. In general terms, your total marketing budget should be 10 per cent of your annual company turnover - from this, advertising should be approximately a third.

Let's say that you have £10,000 to spend over the year on advertising. Pick a selection of publications in which to advertise - a 60/40 mix of print and online. You need to find titles that your clients will read; these will often be titles that you wouldn't normally attract PR coverage in, and that you don't normally read (*Marketing Week*, for instance). Pick titles in your industry (*3D World* is perfect if you're an animation company and want to attract new business, for example). It's also a good way of attracting potential staff, other facilities with overflow work and your competition. Never be afraid to ask your clients what they read.

Now phone up and ask the advertising manager for a rate card, a free copy of the magazine and the circulation details. Remember that if the magazine is ABC audited, these will have to be 100 per cent true. The next step is buying space, and here's a top tip: instead of purchasing a full-page advert in one issue, buy three 'strip' adverts over three issues. This means that you get three times the coverage and your advert sits among the editorial, rather than on a separate page. All magazines will have rate cards and, to

negotiate, I would suggest heading for 20 per cent below this to start off with. You're more likely to get a discount if you buy more than one advert. If they won't negotiate on price, try for a bigger advert or an additional insertion.

Now that you have the space, content is king. Your campaign should be branded - use the same style of artwork for all the titles you advertise in, perhaps with different 'taglines' for different markets. You want readers to be intrigued, and you want to familiarise them with your branding. Look at the other types of ads and decide which stands out. If you've worked on someone else's branding and identity (perhaps you worked on a VW commercial, for instance), this is a great way of showing what you can do. However, don't forget to gain permission from your client to showcase the ad, and only do so if the project is fairly recent.

Include your company name, your logo, a descriptive line (for example, 'the magazine for 3D artists'), reliable contact details and your website address. A good way to measure the effectiveness of your advert is to put a special offer on it, or a competition, to collect the details of people who are interested in you. You can do

● **OTHER RESOURCES**
Head here for free circulation information on magazines
www.abc.org.uk

The Chartered Institute of Marketing offers a series of handy PDF guides on branding
www.cim.co.uk/brands

Get recommendations from design companies for inexpensive, creative freelancers who know the graphics industry. For example, Treefrog Design (www.treefrog-design.co.uk) and Fresh Produce (www.fresh-produce.co.uk)

USE THE SAME STYLE OF ARTWORK FOR ALL TITLES YOU ADVERTISE IN

this by directing people to your website to fill it in, giving you some crucial data for the future.

Your branding should be the same for online advertising, and make sure your site reports show the 'click-throughs' and where they're from. Many magazines now have widely read e-zines that can be a good electronic advertising source. A newer method of advertising is via search engine optimisation, where you pay to get your website listed higher in Google ratings. Also included in your advertising fund should be a minimal amount for directories.

Remember that advertising is part of a mix of promotional activity, and you may not get calls back from it straight away. Have faith in your branding - if it's effective, it will work hard for you and the calls will come.

Sadie Paris is the Managing Director of Bubble & Squeak, a PR agency specialising in broadcast, postproduction and visual effects, with offices in London, Los Angeles and Boston
www.bubblesqueak.co.uk



Making 24: The Game Part One

Turning a TV show as iconic as 24 into a game is no easy task. Over the course of a new four-part project diary, SCEE's Mark Green and Rob Hill reveal the highs and lows

For a game like 24, characters come first. Well, almost. The absolute first thing is consideration of rights – which, as production of a videogame hadn't been directly negotiated into any of the original television contracts, was something that had to be negotiated with each of the 15 main actors from the TV series. Kiefer Sutherland was the first to be signed, and we probably wouldn't have proceeded with the game if we hadn't got that sorted early.

Then, of course, there's the story. The game's structure at least partly suggested itself from the beginning; breaking down into 24 one hour 'instalments'. We were fortunate enough to get 24's in-house scriptwriter Duppy Demetrius onboard to devise and write the script for us, and, once he had a draft version ready, we began working through it with him, making sure it was workable from a game perspective.

Then came the characters, and a lot of time on the transatlantic wires listening to actors and battling MP3 files back and forth. Big names were not necessarily a must – at least, not in the conventional sense. There are a group of very good actors out there who have a great deal of experience in voice acting for cartoons. In particular, their range (voice actors are often expected to double up in their roles and take on a number of parts) combined with the quality of their acting makes them perfect for the roles.

The A list – the stars from 24, the Kiefer Sutherlands, Elisha Cuthberts and Carlos Bernards of the world – tend not to have much experience of the interactive market, but what they lack in experience they make up for in talent. Kiefer, in particular, was quite extraordinary. He's a very intense man, and once he gets into the mode, he's there – bang, bang, bang.

For those actors who found the videogames medium utterly unfamiliar, and also to aid our motion capture actors, we created animatics so that they could see 'scarecrow' figures gliding across the screen and get an idea of what their characters would be doing

while they were delivering their lines. Given that we had one of the show's scriptwriters onboard to write the cutscene script, it's probably not surprising that the actors were very happy with it and recorded it pretty much word for word. Unfortunately, the same can't be said for the in-game script, which had to go through several revisions before it was good enough. It's very tricky to write believable, easy-to-deliver lines that are solely designed to provide information to the player. In fact, we did have one instance when Kiefer looked at a line, then looked at us and said: "There's no way those words are coming out of my mouth!" Needless to say, we soon rewrote that particular line.

Building the characters was tricky. PR photos were too moody, so we contacted Rodney Charters, 24's Director of Photography,

and got him to build a mini-studio for us with some ambient lighting and, most importantly, no hard shadows. Whenever an actor had a spare five minutes, we dragged them into this area

**KIEFER IS VERY INTENSE.
ONCE HE'S IN THE MODE, HE'S
THERE – BANG, BANG, BANG**

to take pictures from eight preset angles around their heads and then gave these pictures to the artists to create the likenesses. The characters themselves were created using *Maya*, with the facial features created from scratch, using the pictures purely as a reference point.

We used a template system – just a quick and easy thing we developed using *Maya* – for all the characters' heads and faces, all based on the one mesh, which we could deform to make different head and face shapes and overlay with different textures to create the various faces themselves. We used the reference photographs to make the textures in *Photoshop*, which was easy enough to do with the sets of photographs we eventually had. We also built up a bank of clothing models and textures that we could use to dress our different characters.

Once we were right up close with a character in cutscenes, we used Image Metrics' facial animation production system. The actors were filmed while reading their lines, and asked to 'face-act' at the same time. Using blendshapes created from cluster manipulation, we

IN OTHER ISSUES

ISSUE 71 PRODUCTION

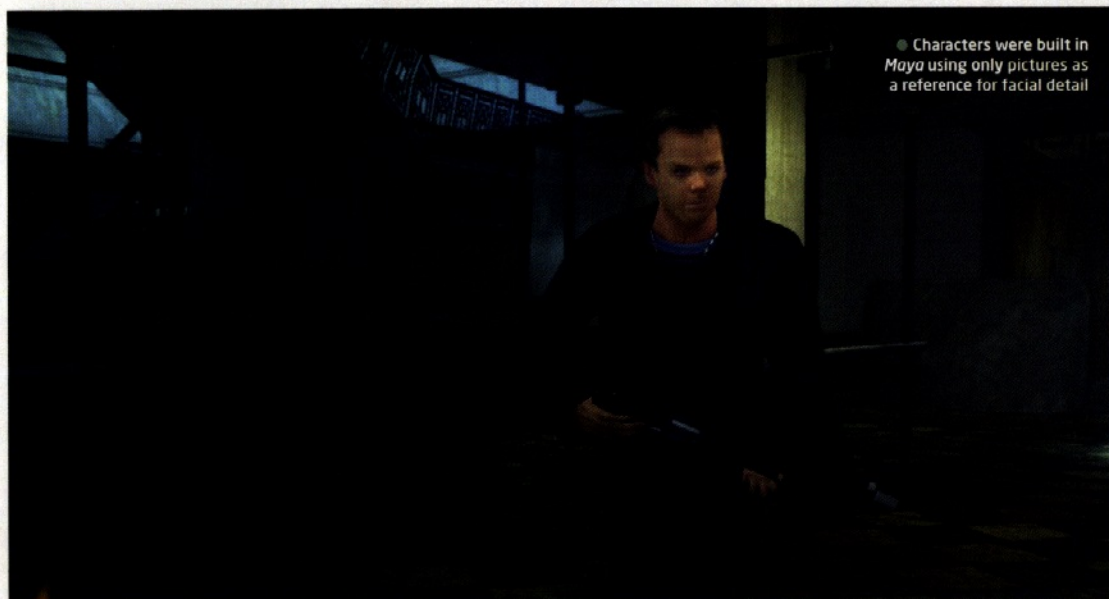
Preproduction over, the 3D team gets to work in earnest

ISSUE 72 POSTPRODUCTION

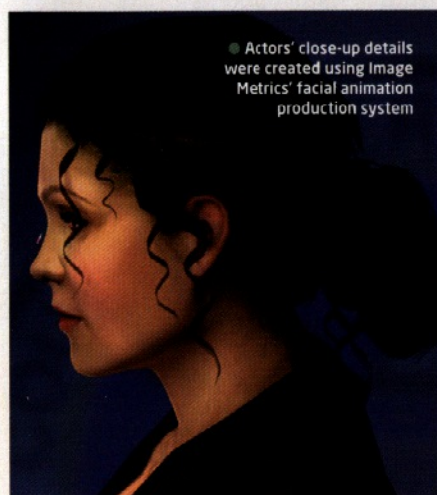
Testing, tweaking and other vital last-minute refinements

ISSUE 73 MARKETING

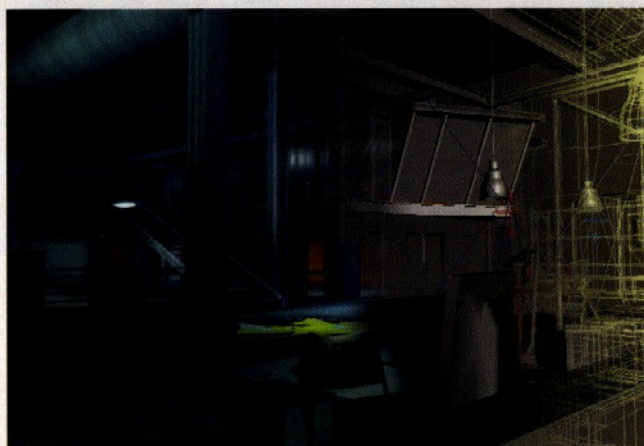
24: *The Game* is finally released. But will it be a hit?



● Characters were built in Maya using only pictures as a reference for facial detail



● Actors' close-up details were created using Image Metrics' facial animation production system



● This is a virtual recreation of 24's familiar CTU set, though it looks eerily devoid of people running around and pretending to look busy at this early stage

built up a set of facial poses, which, when mixed together, were matched to each utterance to get some authentic facial expressions for our characters. This system was also used for lip-synching, along with an in-house system for longer shots.

CHARACTER BUILDING

The character artist team has a core of just two people: Rob Hill and Candice Teo, although we co-opted three more at the height of the character creation process. Between us, we created over 120 unique characters for the cutscenes. In-game, apart from the stars, we have various sets of characters, such as terrorists, nurses, doctors, CTU workers, pedestrians and so on. Within each set, we can swap textures and clothing styles to get six to eight variations. These sets vary in complexity: pedestrians for example, because there are so many more of them, need to be rather more efficient than the others. So we have about 500 vertices per pedestrian, compared to around 1,000-1,500 vertices for a game character and up to 4,000 vertices for a cutscene character. The cutscenes, with their extreme close-ups, need to be more detailed.

Then, of course, we have to get the characters moving. In our initial game design, we had a fairly good understanding of what

would be required, but new movements were constantly added as the characters were play-tested in the game environment. The cutscenes are all motion captured, while the game itself is a mixture of mocap and hand animation. We have a blending system in-game so that the motion between two moves can be blended together. We're also using Havok's Ragdoll physics, so that if a character gets hit by a car, he'll fly backwards in exactly the right trajectory according to where and how he was struck.

There are over 300 general game moves that each character can make. The list runs high because, for instance, the movement will be different if a character is carrying a weapon, different according to which weapon it is, and different again according to whether they're trained to use that weapon or not. Then there's a set of all these moves, yet realised specifically for a female character. We use the same skeleton for all characters, so in theory you could put any animation on any character, though it has to be said that Jack Bauer looks all wrong with feminine movements!

Next on Making 24: The Game ... with the start of production proper, work on the game moves into a much higher gear. Can our intrepid virtual hero, Jack Bauer, survive the experience?

TIMELINE

CHRISTMAS EVE 2003

Contracts are signed with each individual actor to use their likeness in the game. Kiefer Sutherland's was understandably crucial



JAN - SEPT 2004

In-game script is ongoing. 24 scriptwriter Duddy Demetrius is onboard and writes a special script for the game. For TV, close-up headshots are cheap, yet blowing things up is expensive. For games, it's the other way around!

2004 - AUG 2005

Voice recording begins. Major tip: always use another actor as well as the one you're recording, to bounce lines off. It improves things immeasurably

2004 - PRESENT

Character building begins in earnest once decent imagery is captured. A realistic yet stylised look is intended for the game, as too much photorealism will always jar

MAY 2005

Juggling voice recording and alpha code target dates, work is complicated further by having to prepare something to show the public at E3. The event provides an important marketing boost for any game released the following year



PLAY 24: THE GAME

● Developed for PlayStation 2 by SCE's Cambridge studio, 24: The Game is due for release in November. More information can be found online at the URL below. www.24-thegame.com



David Rossman

More than just a visualisation firm, Stack! Studios' render-control software is used on major architectural projects around the world. We spoke to its co-founder **BY BEN VOST**

● A new city near Shanghai called Pujang Town. There are 8,000 lights in this render, produced by Stack! Studios with the help of its *Matador* software

Could you tell us a bit about yourself?

I'm German but I've lived most of my life in Italy. I moved here in 1974 with my parents. My main interests when I first used a computer were music, photography, painting, cinema and literature. This helped me to communicate with almost any architect.

I studied architecture in Venice until 1992, and used a computer for the first time in Colombia in an architectural studio when I was 21. Today, I have a company in Italy in a very old city: no traffic, beautiful countryside, good wines, good food. It's important for me to see something really beautiful at least once a day – it would be impossible to work all week without these conditions!

When did you set up your studio?

Stack! Studios was founded in 1999 by myself and a school friend, Massimo Ciani. We dreamt of finding investors to help us make 3D reconstructions of the five versions that were originally designed of the dome of Saint Peter's Cathedral in Rome, but nobody was interested ... so we work for contemporary architects.

It's nice to work in this studio – it's not exactly like an office. Most people arrive here casually, walking through the city. They hear the music from the street and arrive at Stack! Studios, asking if they are in an apartment and whether we live here.

What's your role at Stack?

As mentioned before, I'm the co-founder, but I also do everything! My job involves modelling, rendering, research, beta-testing our own programs and software engineering. I'm also a director, manager

of public relations, photography director, and hardware technician. There aren't too many specialised people at Stack! Studios. Our main offices are in Siena but, in January, we opened another office in Rome, so things are quite busy.

Does being in Italy mean you miss out on any jobs, or does the Internet remove the problem?

It's strange. Back when we founded Stack! in 1999 in this little city, everybody told us that it would be impossible for us to work for architects in Milan or Rome, because they prefer to work with companies based much closer to them. Yet now we have a client base spreading from the US to Japan.

How many people work on an individual job?

Our regular jobs are completed by a single person. On our biggest projects, there will be three *LightWave 3D* users.

Why have you chosen to use *LightWave* for your architectural visualisation work?

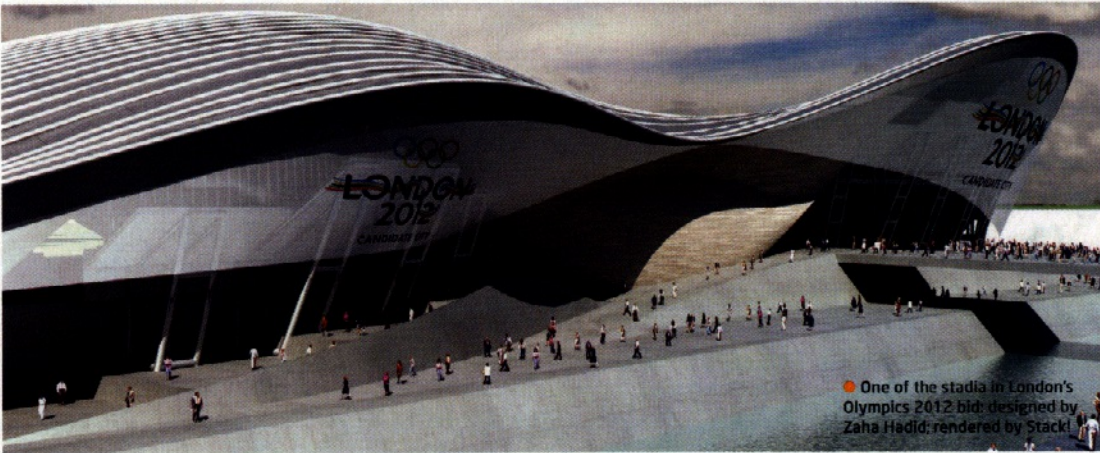
The most important things for us with *LightWave 3D* are the ease of use, the free rendering nodes and the good render quality. Our clients don't like Photon Mapping, since it looks too clean. We don't like Photon Mapping because it requires too many set-up options.

Are these images here subject to post-processing, or are they direct from *LightWave's* renderer?

We produce 99 per cent of our images without any post-processing.



● Another Stack! Studios image, taken from an architectural project produced by Zaha Hadid, Daniel Libeskind and Arata Isozaki



One of the stadia in London's Olympics 2012 bid; designed by Zaha Hadid; rendered by Stack!

How do you control your render farm?

This is the most important part of my company. We control the render farm with our proprietary software, *Matador*, which enables us to render previews directly from *LightWave* – you can do this with *FPrime* or by hitting the [F9] key, but *Matador* offers an incredible speed. Thanks to this program, I can work with *LightWave* from my laptop with a UMTS card far away from my studio and render a PAL-resolution frame of a million polygons with GI in five minutes. It's thanks to *Matador* that we can compete with studios that have many more employees than ours, since only we can make 200 final-quality rendering previews in one day. It took us three whole years to develop it.

But *Matador* still uses LWSN – *LightWave's* network render manager – for rendering?

Yes, it works with LWSN. It was very important for us that with *LightWave*, we don't have to pay for extra licences for extra render nodes. If you begin a project, you don't buy 1U or Blade nodes: you buy some motherboards and processors and you spend about €500 – at most, €1,000 – for a node. You don't then want to spend another €500 or €1,000 for the software.

How has *Matador* changed the way you work over the years?

It was possible to have a commercial version of the first release of *Matador* a few years ago. Today, it allows us to render a single frame across a huge number of CPUs directly from *LightWave* by pressing [F9]. It is multi-user, and renders frame previews and animations locally, or from a remote computer. I can render a frame that would ordinarily take seven hours to produce in four minutes from my laptop at home, by connecting to our 160-CPU cluster via the Internet.



Although best known for architectural visualisation, the studio also works in other sectors of the 3D industry, including industrial design

Every *LightWave* user at Stack! Studios has the same 160-CPU computing power, since *Matador* is extremely fast and has complex 'task-resources-user balancing'. The fact is, we use 100 per cent of our resources 365 days a year. Our turnarounds are incredibly fast. Zaha Hadid Architects in London sometimes receives about 200 rendering previews and 15 to 20 print-resolution renderings from us, all in a two-day workflow! Without *Matador*, Stack! Studios would be a different company and it would be impossible to work on as many projects in one year.

What's the difference between *Matador* and the *Remote Matador* software?

Remote Matador is a 3D rendering service aimed at architects and designers that allows everybody to take advantage of distributed computing. Basically, we give our clients the *Remote Matador* software, which allows them to import their 3D models, assign materials, choose views, environments and to render the images on our dedicated 70-CPU cluster. Since *Remote Matador* includes a large (and growing) material library, users only have to drag and drop the desired material onto a 3D model layer.

The other important thing about *Remote Matador* is that every image is a complete back-up of all the original information. All detail – materials, geometry, lighting and so on – is stored in a database and linked to the image. This means that you can restore every aspect of an older render to a current scene, directly from the image, with a few clicks. A completely revolutionary workflow!

Right now, it's being used by Zaha Hadid Architects in London, at Gregotti Associati International, and by many little architectural and design studios. We are currently working on the Animation module. This is only the beginning – it will keep on evolving.

Can you tell us about the work you did on the Olympic stadia?

We won a competition to produce videos for the 2006 winter Olympics in Turin – one of them has 500 nodes and a 4,000m² office. We won because of our rendering quality and the technical proposal we made.

What are you working on now?

I can't really say, because most of our work involves international architectural competitions, and the participants' names are a secret! Our other major clients are Daniel Libeskind, Arata Isozaki, Fiat and Pirelli. We also do work in other domains as well as visualisation. I'm currently working on a TV clip for the Italian film festival in Venice. ●



Arata Isozaki designed the ice hockey stadium for the Turin Winter Games. This render was for the Olympic Agency



Stack! Studio's *Matador* software makes it easy to generate final images like this remotely on a machine of any quality



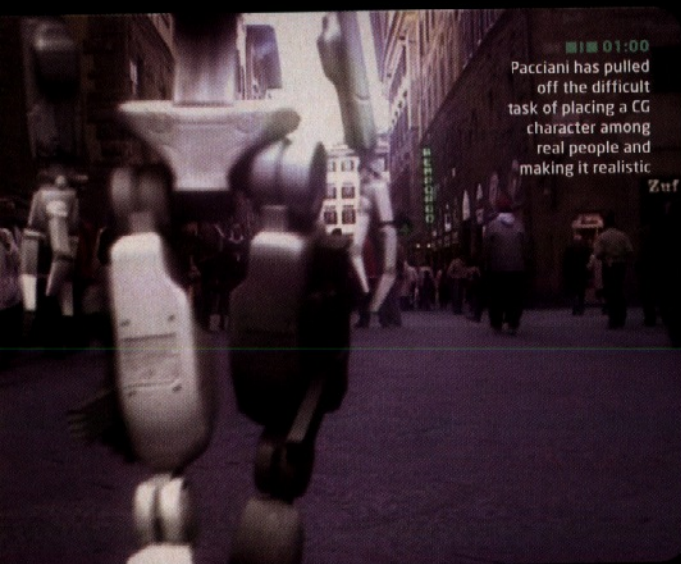
"This image is one of our *LightWave* 3D lighting test scenes," says David Rossman, the company's co-founder

MORE INFORMATION

Find out more about Stack! Studios and *Matador* at www.stack-studios.com and www.arkadin.biz

ABOUT THIS ADVERTORIAL

This story was created by NewTek Europe in partnership with *3D World* magazine. Read the full version in the Community section of the NewTek website at www.newtek-europe.com



■ 01:00
Pacciani has pulled off the difficult task of placing a CG character among real people and making it realistic.

Zuf



■ 01:29
The people in the street scenes were filmed over two days in the city of Florence

SHOWREEL



BV-01 BY ALESSANDRO PACCIANI

To launch our new regular section showcasing the work of students and independent animators, we talk to the young Italian hotshot responsible for BV-01, a five-minute blast of urban robot coolness

THE PITCH

SYNOPSIS

A futuristic robot polices the mean streets of Florence in this spec ad spot

LOOK OUT FOR

- 0:18 Cheeky placement of a Sony microchip
- 0:45 Red and green signals as the robot is powered up
- 0:55 The BV-01 hits the street
- 1:50 Car ride sequence in homage to *Tetra Vaal*
- 2:28 Combat begins
- 3:20 Cool 360 degree camera spin tracks the BV-01
- 3:35 Gunshots finally bring the BV-01 down

SEE ALSO

- *Believe* (2005)
Framestore CFC
- *Tetra Vaal* (2003)
Neill Blomkamp/Embassy VFX

Animators who find themselves spending an inordinate amount of time worrying that their list of achievements doesn't tally with their ever-expanding waistline and advancing years would do well to steer clear of *BV-01*, the short film created by the almost indecently young Alessandro Pacciani. Although just 20 years old, the Italian animator has already single-handedly created one of this year's standout CG shorts.

Boasting a visual quality equal to the output of major effects facilities, *BV-01* is an astounding blend of CG robotics and handheld camera work. Incredibly, Pacciani has had no formal training. "I started to learn the basics of 3D myself while I was still quite young, and then started work when I was just 15 as a programmer at a software house, though that was a non-CG job," he explains.

Leaving behind C++ for the world of advertising, Pacciani then began designing for numerous creative agencies in his native Italy, before moving on again to work as a visual effects supervisor on TV commercials, working for such prestigious clients as car companies Ford and Mazda. "I no longer have a full-time industry job because I wanted to be able to dedicate more time to my personal projects," he says.

The self-funded *BV-01* project sprang from a fascination with industrial robotics and sci-fi films. "I've always wanted to

make a cyberpunk movie with a robot that goes around the city, with the crowd filmed by a camcorder. And I also like to put forth the idea of a decision-making robotic system that's fully integrated in the society of a near future."

Pacciani cites the experimental shooting and editing style of Chris Cunningham as an influence, but says his biggest inspiration was Neill Blomkamp at Embassy VFX. However, while Blomkamp's famous *Tetra Vaal* animation provides a blueprint for the handheld filming style and 'robotic policeman' in the community concept, Pacciani says he'd already been developing the idea for *BV-01*: "After seeing his robot movie last April, I decided to include a dedication in tribute to his work."

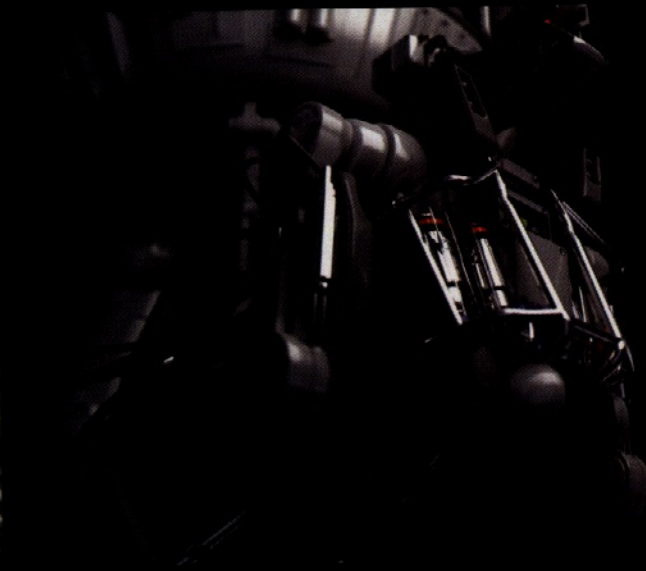
SHOOTING THE POLICE

Modelling the robot from sketches, which in turn were based on a drawing made while still at school, Pacciani then began storyboarding and deciding on specific shots and locations in the city of Florence. He ultimately spent two days in the city shooting handheld footage, including many scenes populated by the local police. Surprisingly, they had no problem being filmed.

"They really liked my idea about the robot, and I ended up wasting a lot of time talking to them and answering questions," laughs Pacciani. "The rest of the people in the footage weren't aware of the project, though. I just filmed a 'real' snapshot of society. There's no acting, only the truth."



In this scene, the robot is shown preparing itself for combat



This close-up shot reveals the detail that has gone into ensuring that the robot moves in a realistic fashion



RESUME

NAME
Alessandro Pacciani

AGE
20

WEBSITE
www.pacciani.com

BASED
Florence, Italy

CAREER HISTORY

- 2000-2001
C++ programmer at a software studio
- 2002-2004
VFX supervisor for broadcast commercials
- 2004-2005
Independent film-maker and VFX supervisor

The three hours of footage obtained in Florence was then edited down to 15 minutes (though Pacciani eventually settled on a running time of five minutes), with more than 100 effects shots required. Having already devoted three months to pre-viz, 3D modelling, environment reconstruction, animation, lighting and rendering, Pacciani then worked for a further two months on postproduction, locking down the edit, performing compositing and doing the audio sync for the film. "With only me working on the project, the production process was very slow," he reveals.

MOCAP MACHINE

3ds Max was used for the modelling and animation, the latter requiring a combination of keyframing and motion capture. The differences between the robot's rig and that of a human made this difficult. "The BV-01 doesn't have a spinal column or abdomen, for one thing, and sometimes its head collides with the flashlights mounted on the shoulders," Pacciani says.

"But by using mocap, it meant the robot character would appear more 'human'."

Working with a chrome ball, Pacciani took his 360-degree photos at several exposures to facilitate an HDRI lighting model. "I also used the photos for the reflections," he reveals. "For the environment reconstructions of the developing nations portion, and also

for building textures, I used a lot of photos that I'd shot in Tallinn, Estonia."

Since its completion, *BV-01* has been selected for screening at the Great Animation Conference 2005 in France, the Fort Lauderdale International Film Festival and the Hollywood International Film Festival. It also picked up the Audience Award at the Human Rights Watch International Film Festival. "I've also received positive feedback from Neill Blomkamp, Sony Computer Entertainment America, and many other people around the world," says Pacciani.

"I LIKE THE IDEA OF A DECISION-MAKING ROBOTIC SYSTEM THAT'S FULLY INTEGRATED INTO THE SOCIETY OF A NEAR FUTURE"

ALESSANDRO PACCIANI, CREATOR OF BV-01

While proud of what he's achieved, Pacciani does admit he'd love to be able to change a number of things about the film. The plan is to return to the concept one day and create a prequel that "explains some of the hidden concepts in this version". Right now, however, he intends to continue to improve his directorial techniques, and to start working as a VFX supervisor on full-length film production. He already has his next project completely planned out, and he's hoping to find a producer for it. Interested industry moguls can contact him via his website. ●

WATCH THE MOVIE

You can find *BV-01* in the Downloads section of the *3D World* website (www.3dworldmag.com) or view the short online at www.pacciani.com/robot

● The BV-01 model is composed of more than 614,340 individual polys. The rig that drives it contains 23 joints

SEND IN YOUR WORK

Want to see your own animations in *3D World*? Email us details at 3dworld@futurenet.co.uk, and you could see your own short films featured on these pages

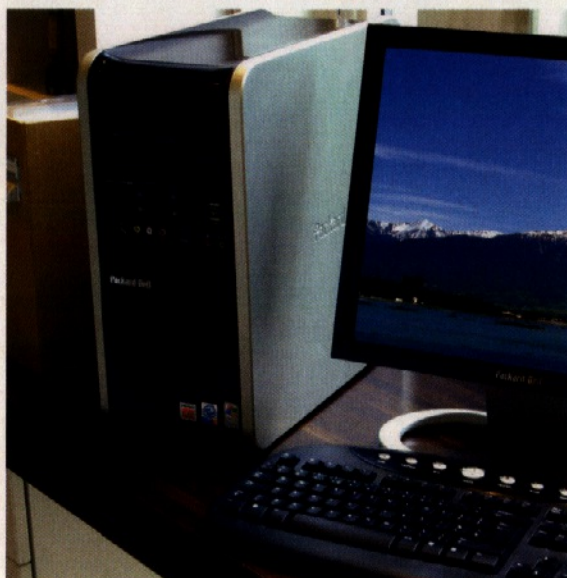
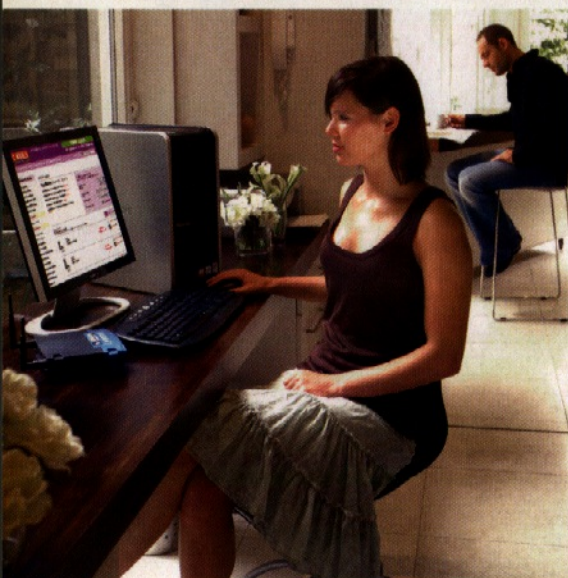
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INSPIRATIONS

Marc Craste on an early encounter with the music of Nick Cave and the Bad Seeds that almost... almost... resulted in a striking short film

• Frames from Marc Craste's storyboard for *The Carny*, a planned short film inspired by the Nick Cave and the Bad Seeds song of the same name. "It's circus music from hell, with a wonderful story," says the BAFTA-winning animator



"I FIRST HEARD *The Carny* on the soundtrack of the film *Wings of Desire*. Just prior to seeing it, I'd heard a song called *Sad Waters* by Nick Cave and the Bad Seeds, which pretty much blew away everything I'd been listening to up until that point. Two weeks later, I'm watching the film, and this amazing piece of music comes on. Once again, it was its haunting sadness that appealed to me, plus Cave's wonderful lyrics.

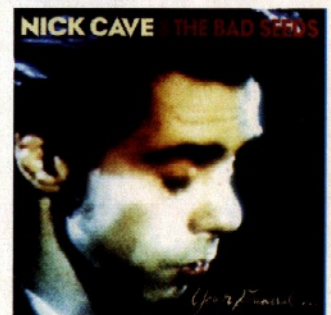
"The Carny combines circus music from hell with a wonderful story about a bunch of freaks, their sadistic owner and an old horse named Sorrow. Because the lyrics read like a short story, it seemed to suggest a film – a straight visual interpretation of the text. In hindsight, I'm not sure that it's a valid thing to do, but it seemed like a good idea at the time, so I started working on a storyboard shortly after seeing the film.

"A friend of mine had taught himself *LightWave*, so our idea was to shoot as much as possible as live action and

combine it with 3D, heavily textured in charcoal to match my designs. I got some development money, although ultimately no one would fund the project as they felt it was technically a tad ambitious. But it did give me the opportunity to meet Nick and the rest of the band, who were really enthusiastic and full of encouragement. A few years after this, I got a call from them to see if it would be possible to include the storyboard on their 'Best of...' video compilation, but as I was living in Copenhagen at the time, it was too difficult to organise.

"In a way, though, I did get to make a film based on a Nick Cave song: *Jojo in the Stars* is very much my *Sad Waters*. If I'd have been a rock star, it would have been a weepy song, but as it is I'm an animator, so it's a cartoon."

Marc Craste is a Senior Animation Director at Studio AKA in London. *Jojo in the Stars* went on to win the 2004 BAFTA Award for Best Animated Short Film www.studioaka.com



HEAR FOR YOURSELF

The Carny can be found on Nick Cave and the Bad Seeds' 1986 album, *Your Funeral, My Trial*, released by Mute. A unique voice in modern music, Cave continues to release albums regularly, the most recent being 2004's *Abbattoir Blues/The Lyre of Orpheus* www.mute.com



Zygote models

Worth over \$1,500

PC/MAC High-quality biomedical and character models in a range of formats

THIS COLLECTION OF high-quality stock models has been provided by the Zygote Media Group. The company is one of the most respected creators of 3D content in the industry, and has provided custom modelling, texturing, animation and effects services for a range of high-profile biomedical, architectural, entertainment and multimedia projects.

On this issue's coverdisc, we have a selection of models from Zygote's library of biomedical content, all of which can be licensed. They include a detailed skeleton, plus male and female integumentary models (skin, hair and nails). Each was created from detailed reference scans. The disc also contains models of a dolphin and a horse.

Each model is provided in C4D, *LightWave*, MAX, MB, OBJ and XSI formats. You'll find more content (which can again be licensed) at the company's online store, www.3dsience.com. This includes models of DNA, cellular structures, atomic particles, nanotechnology and viruses, along with animation and images of the human body. The site, which is eventually intended to contain 'everything from quarks to black holes', also contains a range of free medical imagery. Visit the URL below for more information on the Zygote Media Group, www.zygote.com

FACTFILE

FORMAT

C4D / LWO / LWS /
MAX / MB / OBJ / XSI

MINIMUM SYSTEM

Any 3D software
capable of importing
models in one of the
formats listed above

DEVELOPER

Zygote Media Group

WEBSITE

www.zygote.com
www.3dsience.com

USING THE CD

GETTING STARTED

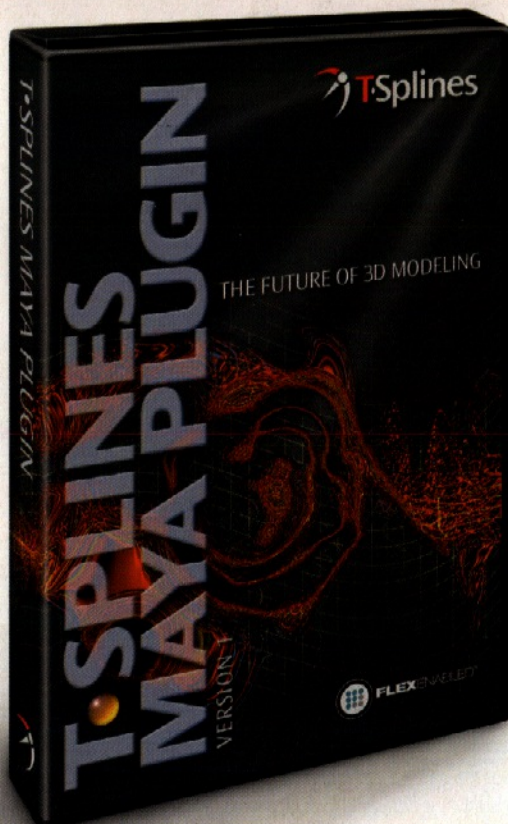
On a PC, this CD should autorun when inserted into your CD drive. If not, run '3dw.exe'. To toggle autorun on and off, use the Control Panel on your computer. On a Mac, choose 3DWClassic or 3DWIOSX to suit your operating system.

USING THE INTERFACE

The disc interface requires Windows 98, Me, 2000, XP or Mac OS 8+. You'll also need an active internet connection to make full use of the interface. For best results, ensure you're using a version 3 web browser or better.

POINTS TO NOTE

- Some software may require free registration over the internet or by phone.
- Some software may not be available in all territories.
- Values quoted are the original prices for which the software was sold (including all packaging and manuals).



T-Splines

Exclusive learning edition

PC/MAC Like NURBS, but better! Try this exciting new modelling technology, available as a Maya plug-in

3D MODELLING HAS traditionally been restricted by a choice between a limited range of technologies. T-Splines, a new 'superset' of NURBS and Sub-Ds, offer an entirely different way of working, enabling artists to "create content in ways that were mathematically impossible before".

This exciting technology, now available as a *Maya* plug-in, greatly reduces the number of control points needed to create complex models, increasing productivity and reducing render times.

This learning edition of the software, available exclusively on our CD before it is released online, cannot export to NURBS or polygons. You can also download a fully functional but time-limited version by visiting the T-Splines website.

In addition, T-Splines, in association with Zygote, has produced T-Splines versions of the Zygote integumentary models featured on this disc. These can be downloaded from the link provided on the disc interface. *3D World* readers can also purchase the full version of the software for an introductory price of \$799 (RRP \$999). More details can be found in the Readme file on the CD, www.tsplines.com

FACTFILE

FORMAT

PC / Mac

MINIMUM SYSTEM

Any PC or Mac capable
of running *Maya* 5.0
or above

DEVELOPER

T-Splines

WEBSITE

www.tsplines.com



FULL CD CONTENTS | What's on the 3D World disc this issue



VIDEO TUTORIALS

TEXTURE WORKFLOW IN XSI

A seven-part series of tutorials, covering the process of setting up a complete texturing workflow in *Softimage XSI*, exporting models to and from *BodyPaint 3D* for detailed work. These tutorials were recorded for CG training company KURV studios by noted artist Robin Konieczny, co-founder of Asylum 3D in London. Note: *QuickTime* is required to view these movies www.kurvstudios.com

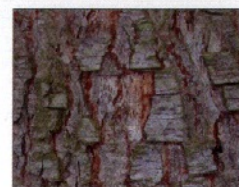
LEAD CONTENTS

ZYGOTE MEDICAL & SCIENTIFIC

MODELS WORTH \$1,500

T-SPLINES (LEARNING EDITION)

For full details, see facing page



OTHER RESOURCES

50 TEXTURES

Seamlessly tiled JPEG images of concrete, soil and bricks, including several bump maps. The files are supplied by resource provider NOCTUA Graphics. These textures are licensed for use in commercial projects www.noctua-graphics.de



CD MISSING?

For a replacement, please contact your newsagent



WOOD WORKSHOP

Take the labour out of tiling images with this seamless texture-editing tool aimed at the creation of wood textures (PC only) www.spiralgraphics.biz

SUPPORTING FILES

Full-size screenshots, project files and other resources to accompany the tutorials and Q&As printed in the magazine this issue
Magazine contents: page 4



TROUBLESHOOTING

THIS IS A FUTURE TECHNOLOGY CD-ROM. This disc has been thoroughly scanned and tested at all stages of production, but - as with all new software - we still recommend you run a virus checker before use and have an up-to-date backup of your hard drive. While every

effort has been made to keep this CD virus-free, Future Publishing Ltd cannot accept responsibility for any disruption, damage and/or loss to your data or computer system that may occur while using this CD or the programs and data on it. Consult your network administrator before installing software on a networked PC.

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in-depth help on the applications included on this CD, or on your hardware or operating system. For software support-related issues, please contact the relevant product's developers. We also regret that we are unable to provide serial numbers over the phone. Future Publishing can only provide technical support for this cover disc for a period of six months after this magazine's on-sale date.



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